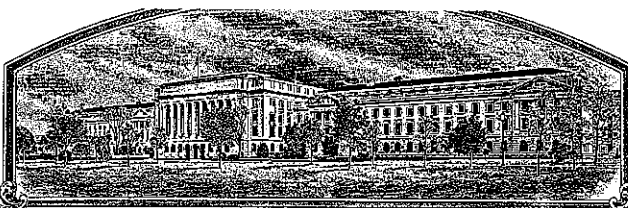


No.

200100117



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Kansas Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE FOREGOING PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMERICAL GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT, COMMON

'Trego'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this fourteenth day of June, in the year of our Lord two thousand one.

Attest:

Alvin H. Port
Acting Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

William H. Hays
Secretary of Agriculture



U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICEAPPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER Kansas Agricultural Experiment Station		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME KS95HW62-6		3. VARIETY NAME Trego	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) Waters Hall Kansas State University Manhattan KS 66506		5. TELEPHONE (include area code) 785-532-6147		FOR OFFICIAL USE ONLY PVPO NUMBER 200100117	
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) University		8. IF INCORPORATED, GIVE STATE OF INCORPORATION		6. FAX (include area code) 785-532-6563	
9. DATE OF INCORPORATION		FILING DATE March 2, 2001			
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) T. Joe Martin Kansas State University Agricultural Research Center—Hays 1232 240th Avenue Hays, KS 67601-9228				FILING AND EXAMINATION FEES: \$ 2705.00 DATE 3/2/2001 CERTIFICATION FEE: \$ 320.00 DATE 6/5/01	
11. TELEPHONE (Include area code) 785-625-3425		12. FAX (Include area code) 785-623-4369		13. E-MAIL jmartin@oznet.ksu.edu	
14. CROP KIND (Common Name) wheat		15. GENUS AND SPECIES NAME OF CROP Triticum aestivum		16. FAMILY NAME (Botanical) Gramineae	
17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,450), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)			
19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? See Section 83(a) of the Plant Variety Protection Act <input checked="" type="checkbox"/> YES (If "yes", answer items 20 and 21 below) <input type="checkbox"/> NO (If "no," go to item 22)		20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
21. IF "YES" TO ITEM 20, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input checked="" type="checkbox"/> FOUNDATION <input checked="" type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED		22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)			
23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)		24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF OWNER NAME (Please print or type) Dr. George Ham		SIGNATURE OF OWNER NAME (Please print or type)			
CAPACITY OR TITLE Associate Director Agricultural Experiment Stn.		DATE 2/6/01		CAPACITY OR TITLE DATE	

INSTRUCTIONS

200100117

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable (in the sense that it will reproduce an entire plant) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$2,450 (\$300 filing fee and \$2,150 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 500, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$300 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvp.htm>

ITEM

- 18a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
(2) the details of subsequent stages of selection and multiplication;
(3) evidence of uniformity and stability; and
(4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 18b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
(1) identify these varieties and state all differences objectively;
(2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
(3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness
- 18c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 18d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 18e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
19. If "Yes" is specified (seed of this variety be sold by variety name only, as a class of certified seed), the applicant MAY NOT reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
22. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
23. See Section 5.5 of the Act for instructions on claiming the benefit of an earlier filing date.

22. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

23. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

Fall, 2000 sold seed in U.S.

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. There is no charge for filing a change of address. The fee for filing a change of ownership or assignment, or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

To avoid conflict with other variety names in use, the applicant must check the variety names proposed by contacting: Seed Branch, AMS, USDA, Room 213, Building 306, Beltsville Agricultural Research Center-East, Beltsville, MD 20705. Telephone: (301) 504-8089.

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions; searching existing data sources; gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OPRM, AG Box 7630, Jamie L. Whitten Building, Washington, D.C. 20250. When replying, refer to OMB No. 0581-0055 and form number in your header. Under the PRA of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The U.S. Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs). Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA at (202) 720-6141.

Trego, PVP Application

Exhibit A: Origin and Breeding History of the Variety

Trego was selected from the cross Rio Blanco/KS87H325

Parents

Rio Blanco

KS87H325 = RL6005/RL6008//2*Larned/3/Cheney/Larned/4/Bennett sib/5/TAM 107

1990: F₁ grown in the field at Hays, KS and harvested as a bulk (All plants from the cross bulked together). No segregation among plants of the F₁ was noted. The only selection criteria used was for resistance to leaf rust.

1991: F₂ grown in the field at Hays, KS and harvested as a bulk. The F₂ population was observed to segregate for chaff color, maturity, and leaf rust resistance. Seed harvested segregated for seed color. White seed were hand selected to plant the F₃ population..

1992: F₃ grown in the field at Hays, KS and individual heads harvested. Individual heads were tested for pre-harvest sprouting tolerance, non-sprouted heads planted in F₄ head rows. The F₃ population was observed to segregate for the same characters seen in the F₂.

1993: F₄ head rows grown at Hays, KS and a single row was harvested and six head selections were made from the row. Selection criteria used included visual yield estimate, height, maturity, non-shattering, leaf rust resistance, test weight, and grain color and hardness.

1994: F₅ was tested in the preliminary yield test at 3 KS locations, the six reselections were grown at Hays and a single row was harvested and six additional head selections were made from the head row. Selection criteria used included grain yield and test weight, height, maturity, reaction to Hessian fly, leaf rust, and wheat streak mosaic virus, coleoptile length, sprouting tolerance, and bread quality factors as measured with the mixograph. Among F₅ selections from this cross the population was segregating for resistance to Hessian fly, leaf rust, wheat streak mosaic virus and for sprouting tolerance and mixing strength.

1995: F₆ was tested in the preliminary yield test at 3 KS locations, the six reselections were grown at Hays and a single head row was harvested. Selection criteria used included grain yield and test weight, height, maturity, reaction to Hessian fly, leaf rust, bacterial leaf blight, soilborne mosaic virus, spindle streak mosaic virus, wheat streak mosaic virus, sprouting tolerance, salt noodle color stability and bread quality factors as measured with the mixograph. Segregation was observed among lines tested in 1995 for reaction to soilborne mosaic virus and spindle streak mosaic virus.

1996: F₇ was tested in the Kansas Hard White Yield Test at 4 KS locations. Seed from the F₆ head row was planted for a small increase at Hays, KS. 200 head selections were

made from the increase for head row purification. Selection criteria used included grain yield and test weight, kernel size, height, maturity, winter survival, reaction to Hessian fly, stem rust, wheat streak mosaic virus, sprouting tolerance, salt and alkaline noodle color stability, polyphenol oxidase level, starch pasting values, and hard wheat milling and bread baking tests.

1997: F8 tested in the Kansas Intrastate Nursery (KIN) at 16 KS locations. 200 hundred head rows were grown at Hays some discarded for non uniformity and the remainder bulked at Harvest. Selection criteria used included grain yield and test weight, kernel size, height, maturity, shattering, reaction to Hessian fly, leaf rust, soilborne mosaic virus, wheat streak mosaic virus, sprouting tolerance, salt and alkaline noodle color stability, polyphenol oxidase level, starch pasting values, and hard wheat milling and bread baking tests.

1998: F9 was tested in the KIN, Southern Regional Performance Nursery, and the Kansas Performance Test with Winter Wheat Varieties. Seed from the F8 head rows were planted at Hays, KS for the breeders seed increase. Selection criteria used included grain yield and test weight, kernel size, height, maturity, shattering, reaction to Hessian fly, soilborne mosaic virus, spindle streak mosaic virus, wheat streak mosaic virus, sprouting tolerance, salt and alkaline noodle color stability, polyphenol oxidase level, and hard wheat milling and bread baking tests.

1999: F10 was tested in same nurseries as in 1998 and an additional increase was made on the breeders seed at Hays, KS. Selection criteria used included grain yield and test weight, kernel size, height, maturity, shattering, reaction to Hessian fly, leaf rust, soilborne mosaic virus, spindle streak mosaic virus, wheat streak mosaic virus, sprouting tolerance, salt and alkaline noodle color stability, polyphenol oxidase level, and hard wheat milling and bread baking tests.

2000: F11 was tested in the KIN and the Kansas Performance Test. Foundation seed was produced at Hays, KS for distribution. Selection criteria used included grain yield and test weight, kernel size, height, maturity, reaction to Hessian fly, soilborne mosaic virus, barley yellow dwarf mosaic virus, wheat streak mosaic virus, sprouting tolerance, salt and alkaline noodle color stability, polyphenol oxidase level, and hard wheat milling and bread baking tests.

Trego is uniform. Variants are limited to plants with brown glume color that occur at a frequency less than 1 in 1000 plants, slightly taller plants at a frequency of less than 1 in 1000 plants, and plants that produce seed with a red seed coat at a frequency of less than 1 in 200 plants. The variants as well as typical plants are commercially acceptable.

Trego is stable. When sexually reproduced, the variety remains unchanged in its essential and distinctive characteristics. Trego was observed to be uniform and stable during the four generations prior to release.

Trego, PVP Application
Exhibit B: Statement of Distinctness

Trego is most similar to Tam 107 and Rio Blanco.

TAM 107 has brown glume color while Trego has white glume color.

TAM 107 seed has a red seed coat while Trego has a white seed coat.

Rio Blanco has a twisted flag leaf at boot while Trego's flag leaf is not twisted.

Anthocyanin is present in the stems of Rio Blanco and it is absent in Trego.

REPRODUCE LOCALLY. Include form number and date on all reproductions.

Form Approved - OMB No. 0581-0055

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, AG Box 7630, Jamie L. Whitten Building, Washington, D.C. 20250. When replying, refer to OMB No. 0581-0055 and form number in your letter. Under the PRA of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*Triticum* spp.)

NAME OF APPLICANT(S) Kansas State University	FOR OFFICIAL USE ONLY PVPO NUMBER 200.100117
ADDRESS (Street and No. or RD No., City, State, and Zip Code) Waters Hall Kansas State University Manhattan, KS 66506	VARIETY NAME Trego
	TEMPORARY OR EXPERIMENTAL DESIGNATION KS95HW62-6

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g. or) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used. Please answer all questions for your variety; lack of response may delay progress of your application.

1. KIND:

1=Common 2=Durum 3=Club 4=Other (SPECIFY):

2. VERNALIZATION:

1=Spring 2=Winter 3=Other (SPECIFY):

3. COLEOPTILE ANTHOCYANIN:

1=Absent 2=Present

4. JUVENILE PLANT GROWTH:

1=Prostrate 2=Semi-erect 3=Erect

5. PLANT COLOR (boot stage):

1 = Yellow-Green 2 = Green 3 = Blue-Green

6. FLAG LEAF (boot stage):

1 = Erect 2 = Recurved 1 = Not Twisted 2 = Twisted

7. EAR EMERGENCE:

Number of Days Earlier Than _____ *

Number of Days Later Than TAM 107 _____ *

8. ANTHOR COLOR:

1 = Yellow

2 = Purple

9. PLANT HEIGHT (from soil to top of head, excluding awns):

cm Taller Than TAM 107

cm Shorter Than

* Relative to a PVPO-Approved Commercial Variety Grown in the Same Trial

10. STEM:

A. ANTHOCYANIN

1 = Absent

2 = Present

B. WAXY BLOOM

1 = Absent

2 = Present

C. HAIRINESS (last internode of rachis)

1 = Absent

2 = Present

D. INTERNODE (SPECIFY NUMBER)

1 = Hollow

2 = Semi-solid

3 = Solid

E. PEDUNCLE

1 = Absent

2 = Present

cm Length

11. HEAD (at Maturity):

A. DENSITY

1 = Lax

2 = Middense

3 = Dense

B. SHAPE

1 = Tapering

2 = Strap

3 = Clavate

4 = Other (SPECIFY):

C. CURVATURE

1 = Erect

2 = Inclined

3 = Recurved

D. AWNEDNESS

1 = Awnless

2 = Apically Awnletted

3 = Awnletted

4 = Awned

12. GLUMES (at Maturity):

A. COLOR

1 = White

2 = Tan

3 = Other (SPECIFY):

C. BEAK

1 = Obtuse

2 = Acute

3 = Acuminate

B. SHOULDER

1 = Wanting

2 = Oblique

3 = Rounded

4 = Square

5 = Elevated

6 = Apiculate

D. LENGTH

1 = Short

2 = Medium

(ca. 7mm)

(ca. 8mm)

3 = Long (ca. 9mm)

12. GLUMES (at Maturity) *Continued*:

200100117

E. WIDTH

☒ 1 = Narrow (ca. 3mm) 2 = Medium (ca. 3.5mm)
3 = Wide (ca. 4mm)

13. SEED:

A. SHAPE

☒ 1 = Ovate 2 = Oval 3 = Elliptical

C. BRUSH

☒ 1 = Short 2 = Medium 3 = Long
☒ 1 = Not Collared 2 = Collared

B. CHEEK

☒ 1 = Rounded 2 = Angular

D. CREASE

☒ 1 = Width 60% or less of Kernel
2 = Width 80% or less of Kernel
3 = Width Nearly as Wide as Kernel

☒ 1 = Depth 20% or less of Kernel
2 = Depth 35% or less of Kernel
3 = Depth 50% or less of Kernel

E. Color

☒ 1 = White 2 = Amber 3 = Red
4 = OTHER (Specify)

G. PHENOL REACTION (*see instructions*):

☒ 1 = Ivory 2 = Fawn
3 = Light Brown 4 = Dark Brown
5 = Black

F. TEXTURE

☒ 1 = Hard 2 = Soft

14. DISEASE: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

☒ 2 Stem Rust (*Puccinia graminis* f. sp. *tritici*)
TTRT RTRQ TPMK QKCS RHMS
RTHJ RTQQ

☒ 0 Stripe Rust (*Puccinia striiformis*)

☒ 1 Tan Spot (*Pyrenophora tritici-repentis*)

☒ 0 Halo Spot (*Selenophoma donacis*)

☒ 3 *Septoria nodorum* (Glume Blotch)

☒ 0 *Septoria avenae* (Speckled Leaf Disease)

☒ 1 *Septoria tritici* (Speckled Leaf Blotch)

☒ 1 Scab (*Fusarium* spp.)

☒ 2 Leaf Rust (*Puccinia recondita* f. sp. *tritici*)
TDBM TCLH PLLM TLLC MGBM PNMR
KDBM PLMR

☒ 1 Loose Smut (*Ustilago tritici*)

☒ 0 Flag Smut (*Urocystis agropyri*)

☒ 0 Common Bunt (*Tilletia tritici* or *T. laevis*)

☒ 0 Dwarf Bunt (*Tilletia controversa*)

☒ 0 Karnal Bunt (*Tilletia indica*)

☒ 1 Powdery Mildew (*Erysiphe graminis* f. sp. *tritici*)

☒ 0 "Snow Molds"

14. Disease (Continued) (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

<input checked="checked" type="checkbox"/> 1 "Black Point" (Kernel Smudge)	<input type="checkbox"/> 0 Common Root Rot (<i>Fusarium</i> , <i>Cochliobolus</i> and <i>Bipolaris</i> spp.)
<input checked="checked" type="checkbox"/> 1 Barley Yellow Dwarf Virus (BYDV)	<input type="checkbox"/> 0 Rhizoctonia Root Rot (<i>Rhizoctonia solani</i>)
<input checked="checked" type="checkbox"/> 2 Soilborne Mosaic Virus (SBMV)	<input type="checkbox"/> 0 Black Chaff (<i>Xanthomonas campestris</i> pv. <i>translucens</i>)
<input checked="checked" type="checkbox"/> 3 Wheat Yellow (Spindle Streak) Mosaic Virus	<input type="checkbox"/> 0 Bacterial Leaf Blight (<i>Pseudomonas syringae</i> pv. <i>syringae</i>)
<input checked="checked" type="checkbox"/> 4 Wheat Streak Mosaic Virus (WSMV)	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> Other (SPECIFY)	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> Other (SPECIFY)	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> Other (SPECIFY)	<input type="checkbox"/> Other (SPECIFY)

15. INSECT: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE SPECIFY BIOTYPE (where needed)

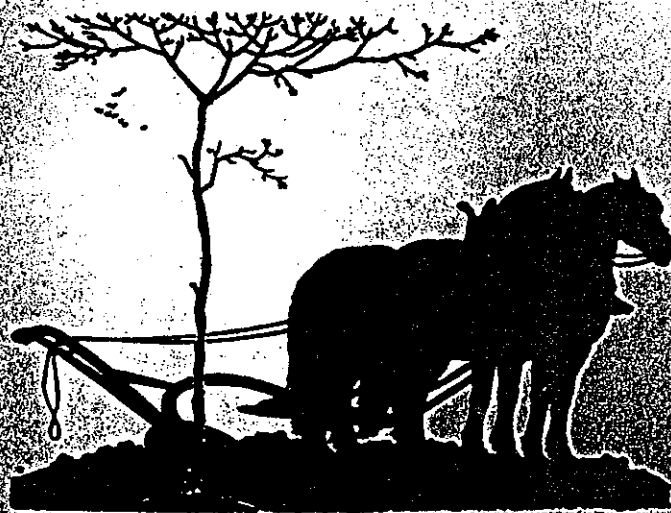
<input checked="checked" type="checkbox"/> 3 Hessian Fly (<i>Mayetiola destructor</i>) Great Plains biotype	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> 0 Stem Sawfly (<i>Cephus</i> spp.)	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> 0 Cereal Leaf Beetle (<i>Oulema melanopa</i>)	<input type="checkbox"/> Other (SPECIFY)
<input checked="checked" type="checkbox"/> 1 Russian Aphid (<i>Diuraphis noxia</i>)	<input type="checkbox"/> Other (SPECIFY)
<input checked="checked" type="checkbox"/> 1 Greenbug (<i>Schizaphis graminum</i>)	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> 0 Aphids	<input type="checkbox"/> Other (SPECIFY)

16. ADDITIONAL INFORMATION ON ANY ITEM ABOVE, OR GENERAL COMMENTS

Trego, PVP Application
Exhibit D: Additional description of the variety

The hard wheat milling properties and bread baking characteristics of Trego were compared to currently grown varieties by the members of the Wheat Quality Counsel in 1997 and 1998. I have attached copies of their reports.

Milling and Baking Test Results for Hard Winter Wheats Harvested in 1997



48th Report on Wheat Quality

A coordinated effort by the agricultural
and baking industries to improve wheat

1997 Miag Multomat (Small-Scale) Samples Kansas

*

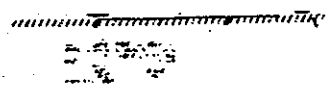
Sample Number	97-407	97-408	97-409	97-410	97-419	97-420		
Variety Identification	Lamed (check)	KS95 H176-1	KS95 H167-3	KS96 HW62-6	Jagger (check)	KS84 063-2W		
Wheat Data				Trego				
FGIS Classification	HRW	HRW	HRW	HWW 24%HR	HRW	HWW		
U.S. Bushel Weight (lbs)	60.2	59.0	59.7	61.8	60.1	60.9		
Hectoliter Weight (kg)	77.5	75.9	76.8	79.5	77.3	78.4		
1000 Kernel Weight	36.0	29.2	37.4	33.6	23.0	26.5		
NIR Hardness	67	65	67	74	71	72		
Wheat Size Test								
Over 7 Wire (%)	82.8	68.2	88.3	74.2	51.6	61.7		
Over 9 Wire (%)	17.1	31.7	11.7	25.7	47.6	38.1		
Through 9 Wire (%)	0.0	0.2	0.1	0.1	0.8	0.2		
Single Kernel								
Hardness	59	59	58	75	79	76		
Weight (mg)	34.9	29.4	37.7	33.7	29.4	29.6		
Diameter (mm)	2.65	2.47	2.88	2.60	2.53	2.49		
Moisture (%)	10.80	10.50	10.40	10.20	9.60	9.80		
Protein (%)	11.60	12.30	12.20	12.20	14.30	13.90		
Ash (%)	1.34	1.34	1.19	1.29	1.22	1.24		
Milling and Straight Grade Flour Data								
Straight Grade								
Flour Yield (% T.P.)	73.0	73.8	73.0	72.0	72.3	69.4		
Moisture (%)	13.70	13.60	13.60	13.50	13.20	13.20		
Protein (%)	10.60	11.00	11.20	11.00	13.30	13.30		
Ash (%)	0.43	0.40	0.38	0.42	0.43	0.42		
Glutomatic								
Wet (%)	2.85	2.75	2.76	2.93	3.59	3.51		
Dry (%)	0.96	0.98	0.98	1.01	1.23	1.21		
Index	95.4	98.7	98.6	98.5	98.2	98.3		
Color								
Kent Jones/Simon	-0.38	0.79	-0.46	-0.28	-0.40	0.79		
Falling Number *	445	506	402	405	592	561		
Starch Damage								
Average Micron Size								
Fisher S.S.	10.6	10.3	10.6	10.7	10.3	10.6		

* 14% Moisture Basis

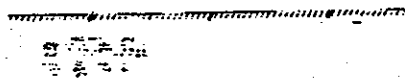
1997 Physical Testing Results

(Small Scale) Kansas

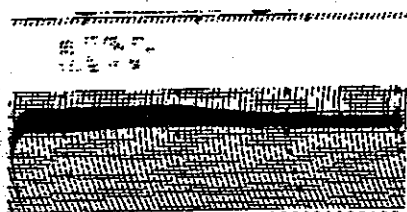
Farinograms



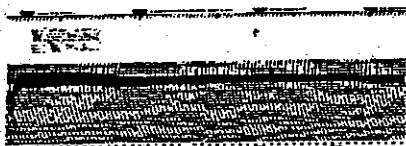
Abs: 60.8 %, Peak: 5.5 min. Stab: 10 min.



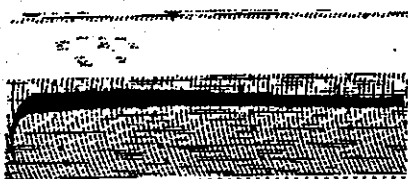
Abs: 56.8 %, Peak: 10 min. Stab: 31 min.



Abs: 57.2 %, Peak: 15.5 min. Stab: 25 min.



Abs: 59.2 %, Peak: 7 min. Stab: 50.75 min.



Abs: 62.5 %, Peak: 14.5 min. Stab: 29.75 min.

97-407
Lamed (check)

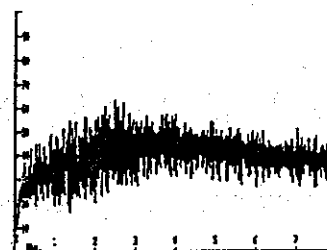
97-408
KS95H176-1

97-409
KS95H167-3

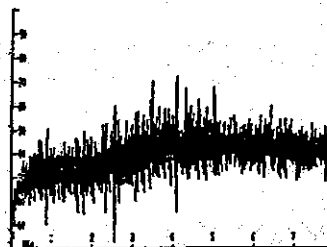
97-410
KS95HW62-6

97-419
Jagger (check)

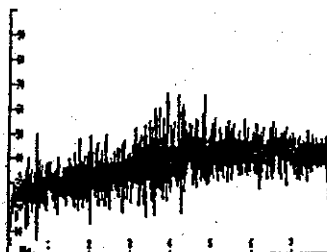
Mixograms



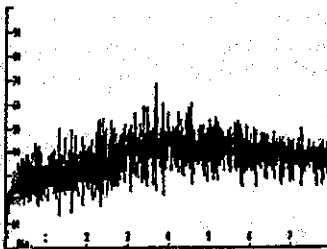
Abs: 64.6 %, Peak: 2.88 min.



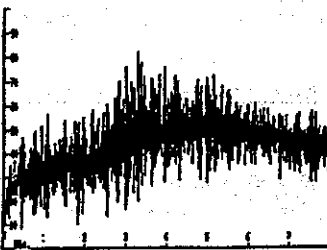
Abs: 62.1 %, Peak: 4.38 min.



Abs: 62.6 %, Peak: 4.38 min.



Abs: 65.3 %, Peak: 4.25 min.



Abs: 67.1 %, Peak: 4.25 min.

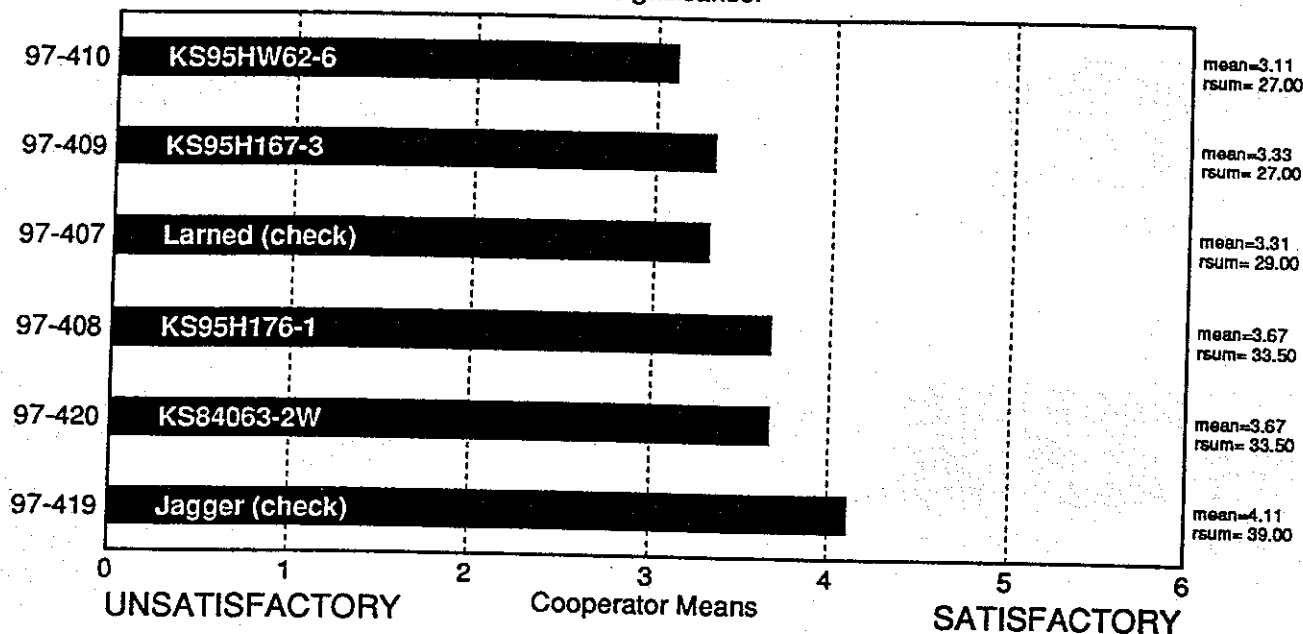
SPONGE CHARACTERISTICS

(Small Scale) Kansas

Variety order by rank sum

No samples different at 5.0% level of significance.

ncoop=9
chisq=3.52
chisqc=3.97
cvchisq=11.07



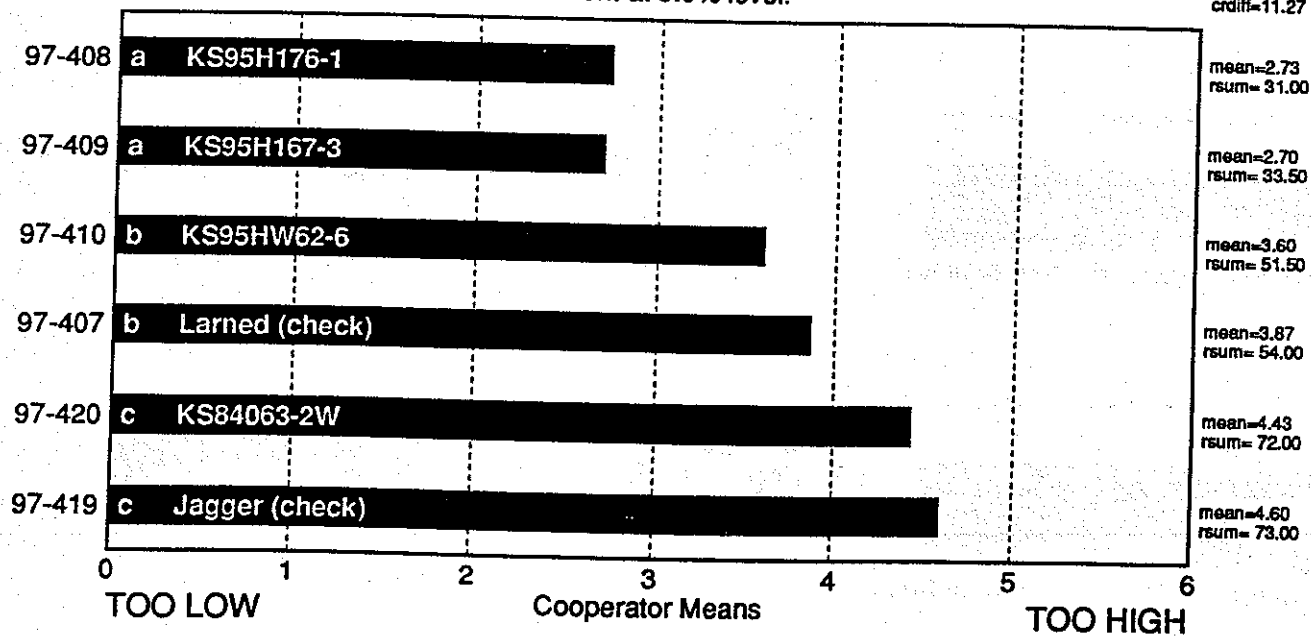
BAKE ABSORPTION

(Small Scale) Kansas

Variety order by rank sum

Samples with same letter not different at 5.0% level.

ncoop=15
chisq=30.99
chisqc=31.65
cvchisq=11.07
ordiff=11.27

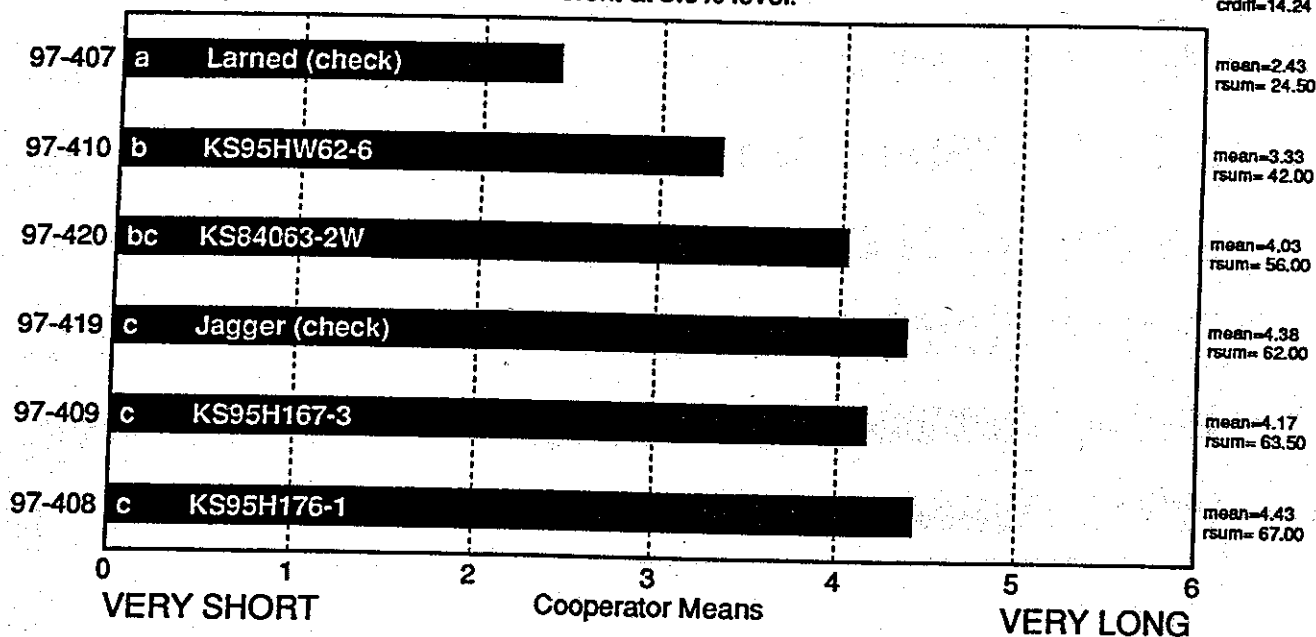


BAKE MIX TIME (Small Scale) Kansas

Variety order by rank sum

Samples with same letter not different at 5.0% level.

ncoop=15
chisq=25.30
cvchisq=25.55
crdiff=11.07
crdiff=14.24

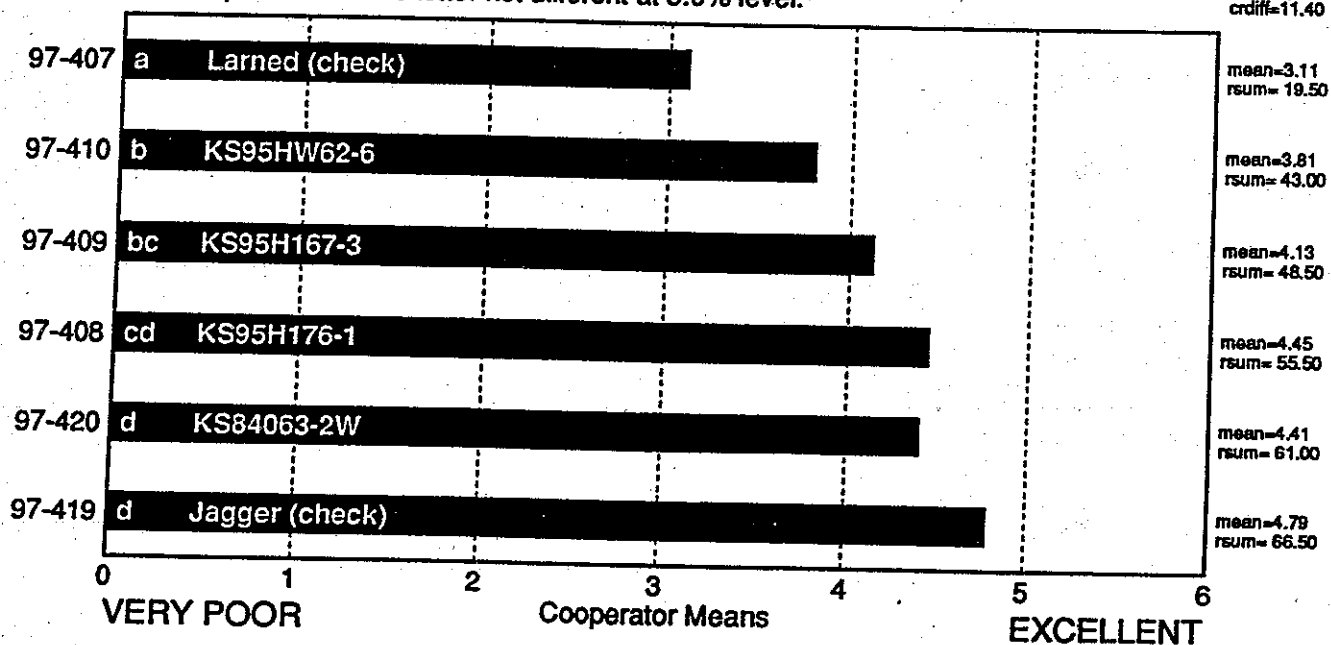


MIXING TOLERANCE (Small Scale) Kansas

Variety order by rank sum

Samples with same letter not different at 5.0% level.

ncoop=14
chisq=28.55
cvchisq=29.82
crdiff=11.07
crdiff=11.40

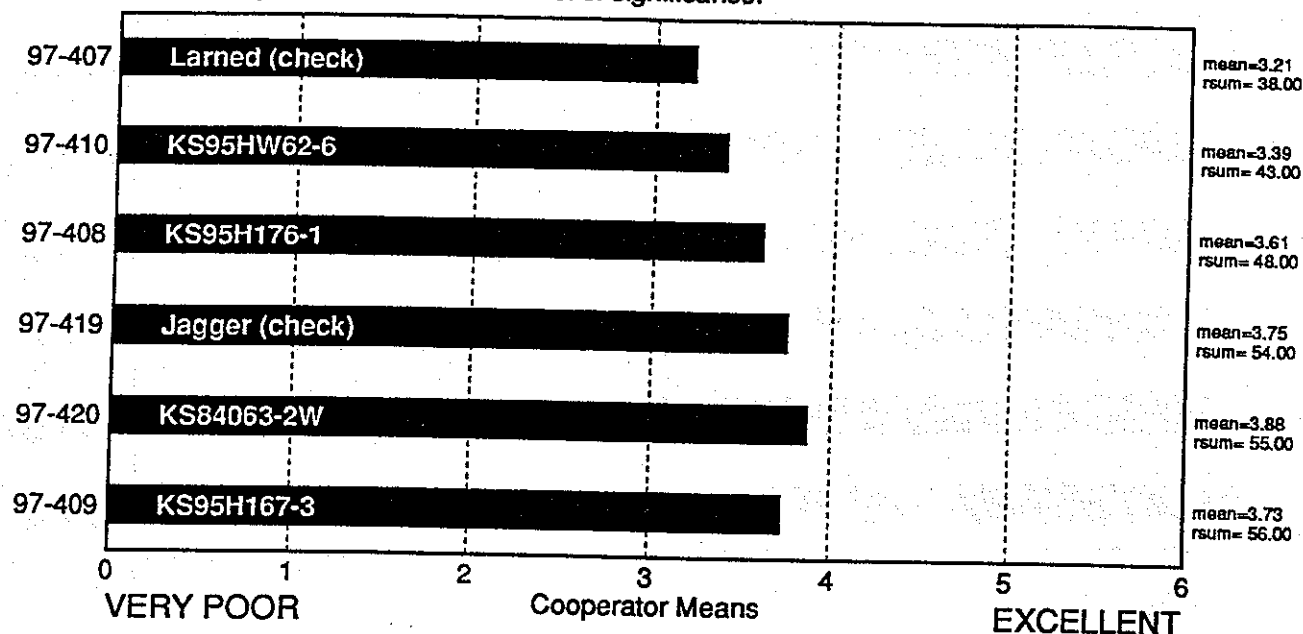


DOUGH CHAR. 'OUT OF MIXER' (Small Scale) Kansas

Variety order by rank sum

No samples different at 5.0% level of significance.

ncoop=14
chisq=5.47
chisq=5.59
cvchisq=11.07



DOUGH CHAR. 'OUT OF MIXER', DESCRIBED (Small Scale) Kansas

	Sticky	Wet	Tough	Good	Excellent
97-407 Larned (check)	2	0	0	12	1
97-408 KS95H176-1	2	0	2	11	0
97-409 KS95H167-3	0	0	1	12	2
97-410 KS95HW62-6	1	1	0	12	1
97-419 Jagger (check)	1	0	5	9	0
97-420 KS84063-2W	1	0	3	11	0

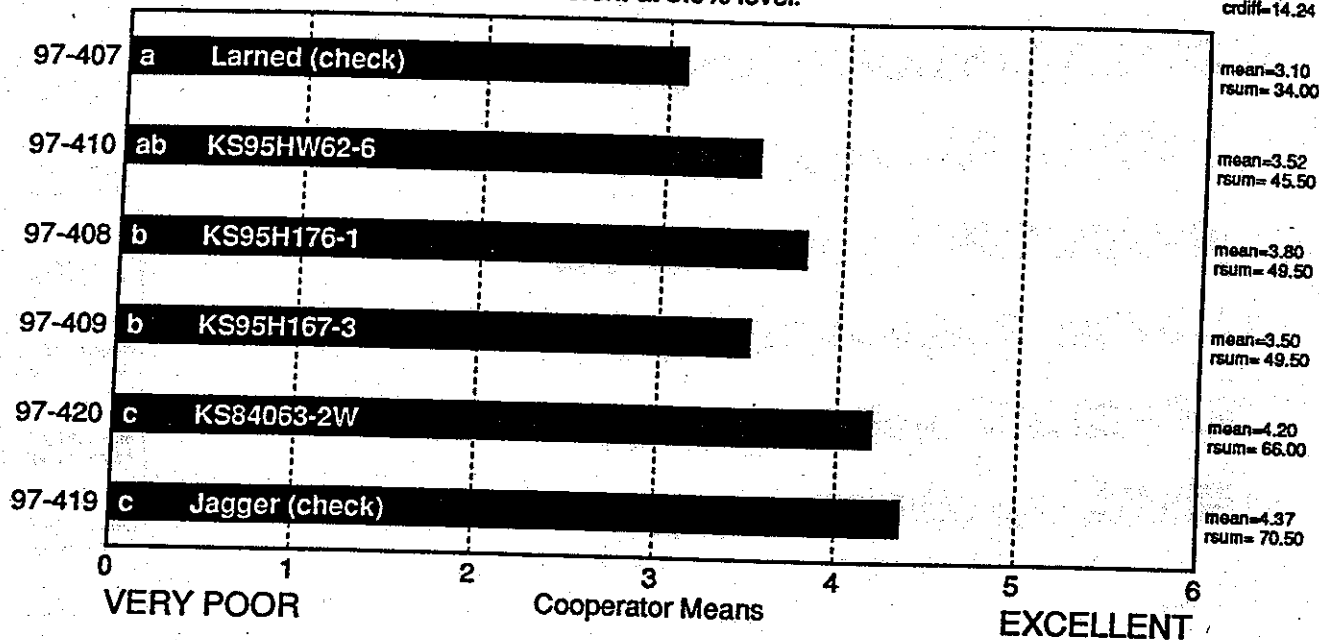
Frequency Table

DOUGH CHAR. 'AT MAKE UP' (Small Scale) Kansas

Variety order by rank sum

Samples with same letter not different at 5.0% level.

n=15
chi sq=17.44
chi sq=17.71
cv chi sq=11.07
ordiff=14.24



DOUGH CHAR. 'AT MAKE UP', DESCRIBED (Small Scale) Kansas

	Sticky	Wet	Tough	Good	Excellent
97-407 Larned (check)	1	0	0	13	1
97-408 KS95H176-1	0	0	2	13	0
97-409 KS95H167-3	0	0	1	14	0
97-410 KS95HW62-6	0	0	1	13	1
97-419 Jagger (check)	0	0	7	8	0
97-420 KS84063-2W	0	0	5	9	1

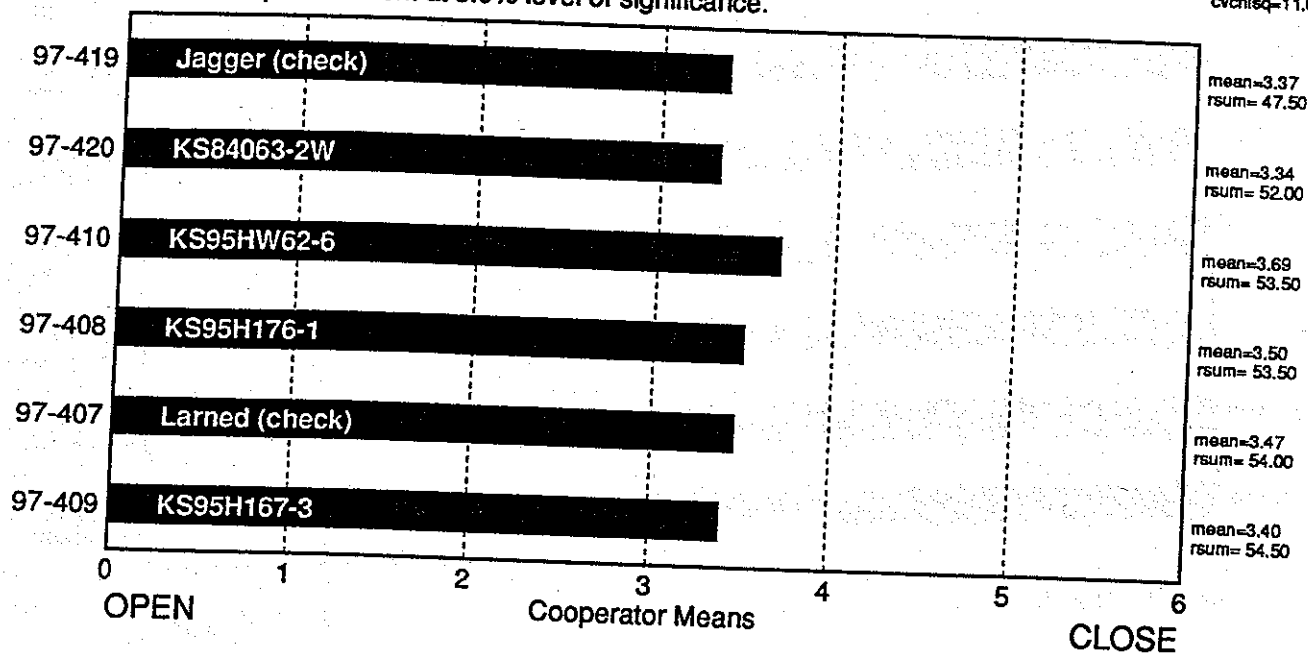
Frequency Table

CRUMB GRAIN (Small Scale) Kansas

Variety order by rank sum

No samples different at 5.0% level of significance.

ncoop=15
chisq=0.64
chisq=0.64
cvchisq=11.07



CRUMB GRAIN, DESCRIBED (Small Scale) Kansas

	Open	Dense	Irregular
97-407 Larned (check)	6	1	4
97-408 KS95H176-1	4	2	5
97-409 KS95H167-3	5	2	4
97-410 KS95HW62-6	3	2	6
97-419 Jagger (check)	4	4	3
97-420 KS84063-2W	3	3	6

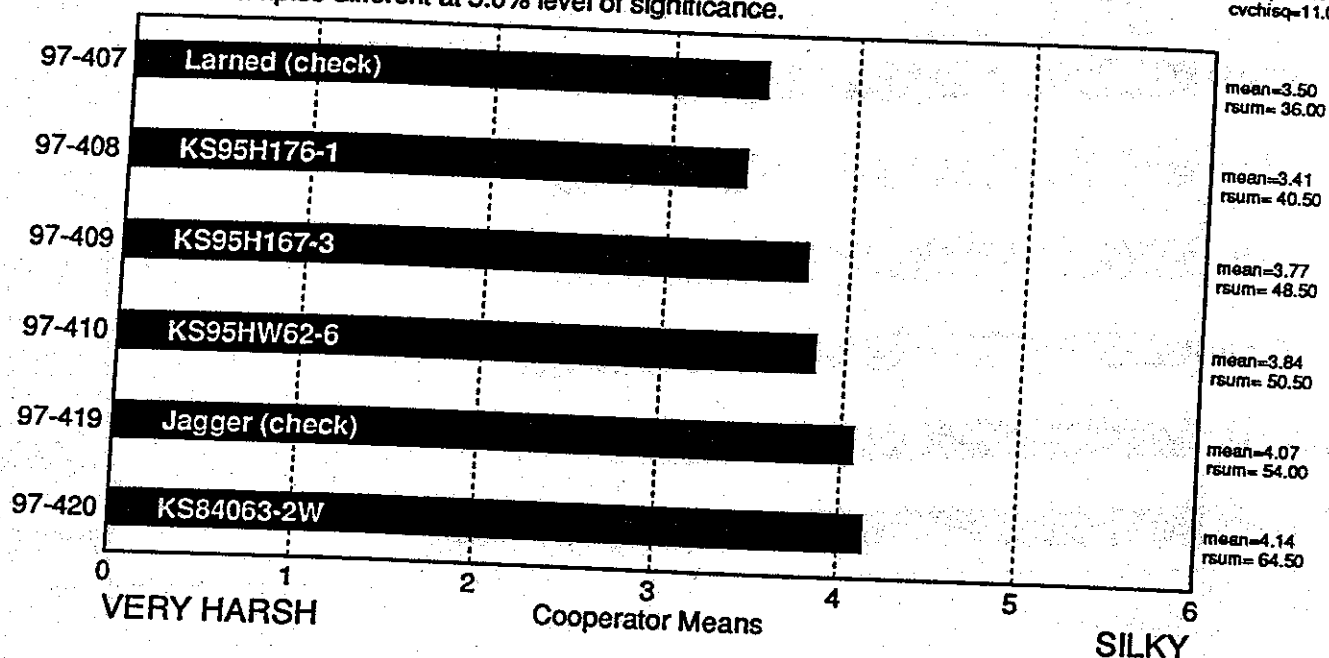
Frequency Table

CRUMB TEXTURE (Small Scale) Kansas

Variety order by rank sum

No samples different at 5.0% level of significance.

ncoop=14
chisq=10.39
chisq=10.85
cvchisq=11.07



CRUMB TEXTURE, DESCRIBED (Small Scale) Kansas

	Coarse	Harsh	Silky
97-407 Larned (check)	3	3	5
97-408 KS95H176-1	4	4	3
97-409 KS95H167-3	4	2	5
97-410 KS95HW62-6	3	3	5
97-419 Jagger (check)	3	3	6
97-420 KS84063-2W	4	0	8

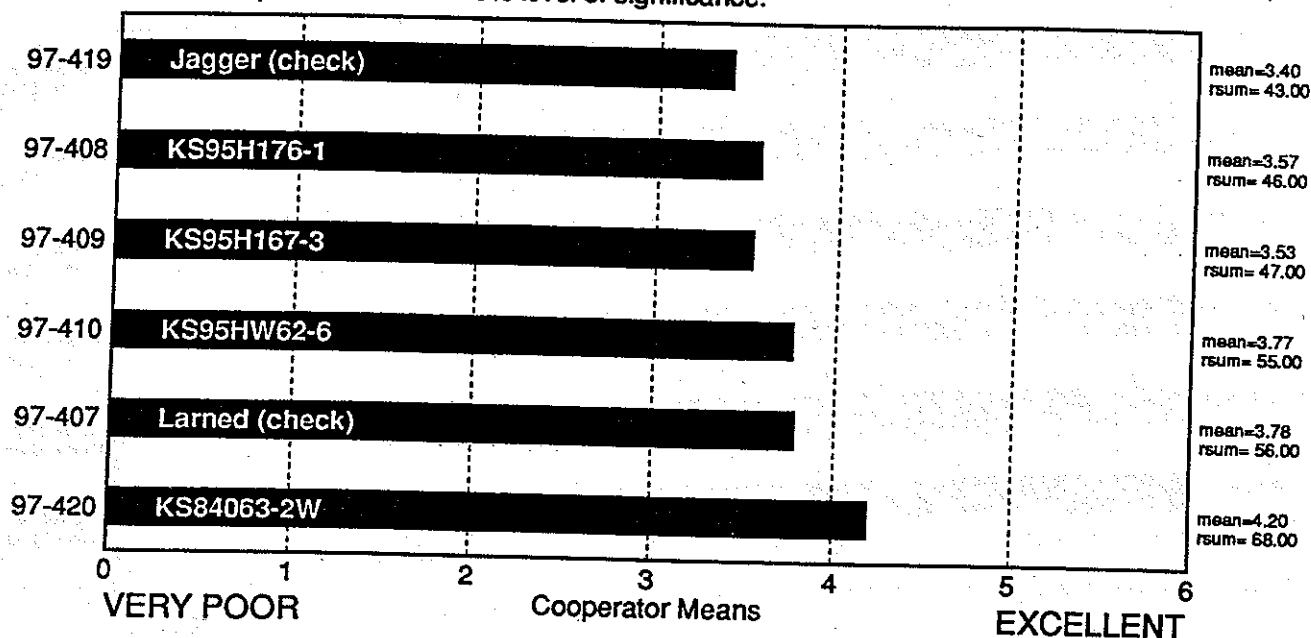
Frequency Table

CRUMB COLOR (Small Scale) Kansas

Variety order by rank sum

No samples different at 5.0% level of significance.

ncoop=15
chisq=8.03
chisq=8.62
cvchisq=11.07



CRUMB COLOR, DESCRIBED (Small Scale) Kansas

	Yellow	Gray	Dull	Creamy	Bright White
97-407 Larned (check)	2	0	0	11	1
97-408 KS95H176-1	1	0	1	11	1
97-409 KS95H167-3	1	0	0	13	0
97-410 KS95HW62-6	1	0	1	10	2
97-419 Jagger (check)	2	0	2	8	2
97-420 KS84063-2W	0	0	1	7	6

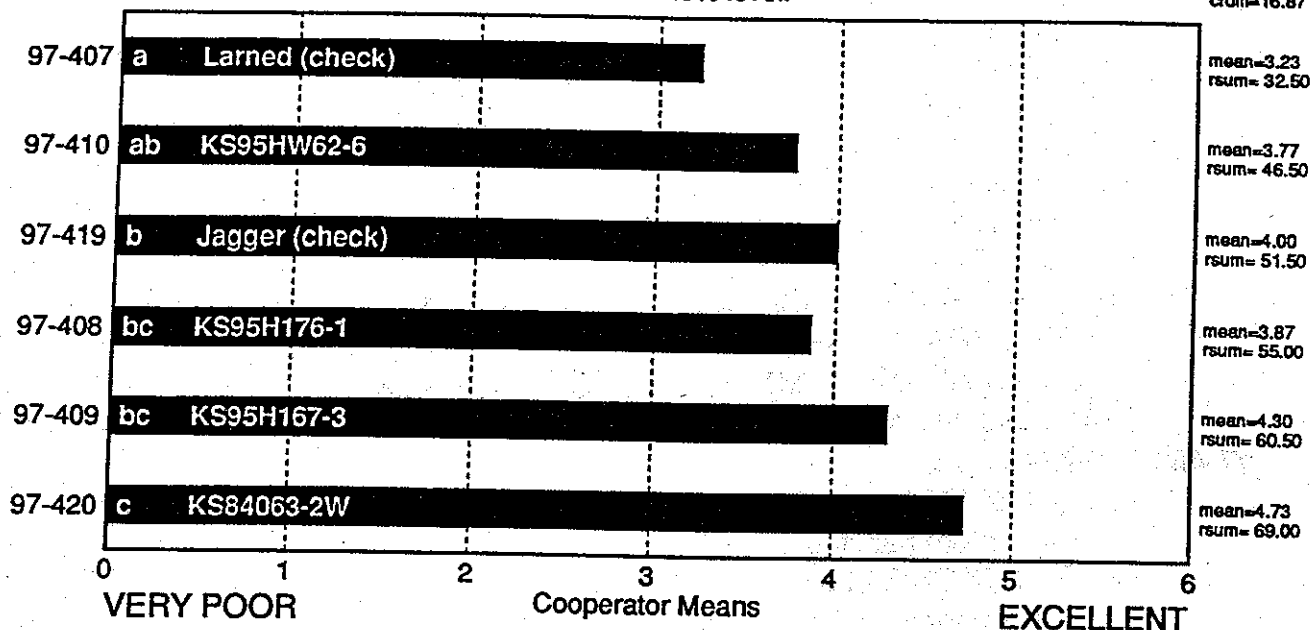
Frequency Table

LOAF VOLUME (Small Scale) Kansas

Variety order by rank sum

Samples with same letter not different at 5.0% level.

ncoop=15
chisq=14.85
chisq=14.91
cvchisq=11.07
crdiff=16.87

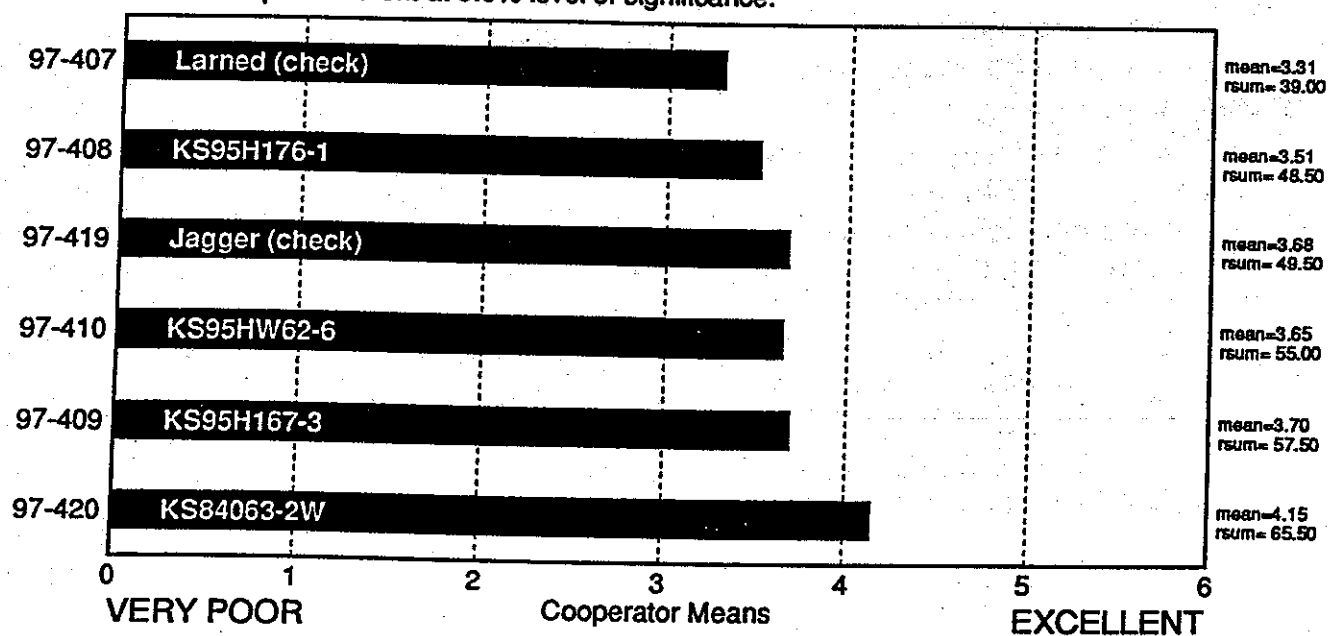


OVERALL BAKING QUALITY (Small Scale) Kansas

Variety order by rank sum

No samples different at 5.0% level of significance.

ncoop=15
chisq=7.76
chisq=7.78
cvchisq=11.07



COOPERATOR'S COMMENTS

(Small Scale) Kansas

97-407 Larned (check)

- SL CR BRIGHT
- 4' had sl higher vol. but was sticky, more open grain
- MARGINAL STRENGTH, AVERAGE VOLUME
- Slightly open, slightly irregular cells. Dry-firm body.
- good volume
- 63 ppm AA; uniform crumb grain; rough crust.
- GOOD MIXING TOLERANCE.

MOISTURE 13.68 ASH .436 (14%MB) PROTEIN 10.43 (14%MB)

FARINOGRAPH - ABS 62.8 (14%MB) PEAK 4.0 MTI 20

FALLING NUMBER 393 STARCH DAMAGE 5.94

- Very good loaf volume for its flour protein content.

97-408 KS95H176-1

- SL CR BRIGHT VERY OPEN GRAIN
- dough was better at 9' but had lower vol.
- VERY STRONG MIXING DOUGH, OPEN GRAIN, GOOD VOLUME
- Slightly irregular cells. Dry, very firm body
- Dry, dead doughs at make-up
- low absorption
- 13 ppm AA; fine uniform cells; slightly rough crust.
- LOW ABSORPTION.

MOISTURE 13.55 ASH .423 (14%MB) PROTEIN 10.82 (14%MB)

FARINOGRAPH - ABS 56.0 (14%MB) PEAK 2.5 MTI 15

FALLING NUMBER 411 STARCH DAMAGE 7.89

- Very good loaf volume for its flour protein content.
- Good crumb and texture.

97-409 KS95H167-3

- at 7.5' had very shrunken sides; at 9' was more open
- GOOD STRENGTH, EXCELLENT VOLUME, SL. OPEN GRAIN
- Creamy, slightly irregular cells
- 13 ppm AA; thin cell walls; exc. crumb grain.
- LOW ABSORPTION.

MOISTURE 13.64 ASH .423 (14%MB) PROTEIN 10.85 (14%MB)

FARINOGRAPH - ABS 55.6 (14%MB) PEAK 8.5 MTI 10

FALLING NUMBER 354 STARCH DAMAGE 6.78

- Very good loaf volume for its flour protein content.
- Good crumb and texture.

COOPERATOR'S COMMENTS--Cont'd

(Small Scale) Kansas

97-410 KS95HW62-6

- best vol. @ 5'; sl better grain @ 4'; sl sticky @ 6'
- GOOD VOLUME, NICE INTERIOR
- Creamy, slightly irregular cells
- 38 ppm AA;
- GOOD MIXING TOLERANCE.
- MOISTURE 13.55 ASH .441 (14%MB) PROTEIN 10.87 (14%MB)
- FARINOGRAPH - ABS 58.9 (14%MB) PEAK 6.0 MTI 10
- FALLING NUMBER 378 STARCH DAMAGE 8.14
- Good loaf volume for its flour protein content.

97-419 Jagger (check)

- VERY OPEN SHOTTY GRAIN
- 7' & 10' mix were more elastic and had lower vol.
- Strong/Slightly Creamy
- VERY GOOD STRENGTH, GOOD VOLUME
- Irregular, slightly open cells. Volume down. Silky texture
- good protein
- low absorption
- 38 ppm AA;
- slightly sticky out of mixer.
- GOOD MIXING TOLERANCE. GOOD MIX TIME.
- MOISTURE 12.98 ASH .456 (14%MB) PROTEIN 12.96 (14%MB)
- FARINOGRAPH - ABS 60.8 (14%MB) PEAK 6.5 MTI 10
- FALLING NUMBER 483 STARCH DAMAGE 8.14
- Crumb color was yellow and dull
- Good loaf volume for its flour protein content.
- Good crumb and texture.

97-420 KS84063-2W

- VERY OPEN SHOTTY GRAIN
- 7' was very shrunken; 11' had low vol & stringy dough
- Overall the Best
- GOOD CRUMB COLOR, ACCEPTABLE INTERIOR, ABOVE AVG. VOLUME
- Irregular, slightly open cells. Good body. Silky texture
- good color
- good protein
- 25 ppm AA; exc. loaf symmetry and crumb grain; soft crumb.
- GOOD FLOUR OVERALL.
- MOISTURE 12.88 ASH .429 (14%MB) PROTEIN 12.83 (14%MB)
- FARINOGRAPH - ABS 60.5 (14%MB) PEAK 8.5 MTI 10
- FALLING NUMBER 420 STARCH DAMAGE 7.45



1998
Milling and Baking Test Results
for
Hard Winter Wheats

Editor:

Patrick J. McCluskey
Department of Grain Science
Kansas State University
Manhattan, KS

Coordinator:

Ben Handcock, Executive Vice President
Wheat Quality Council
Pierre, SD

Kansas: 1998 (Small-Scale) Samples

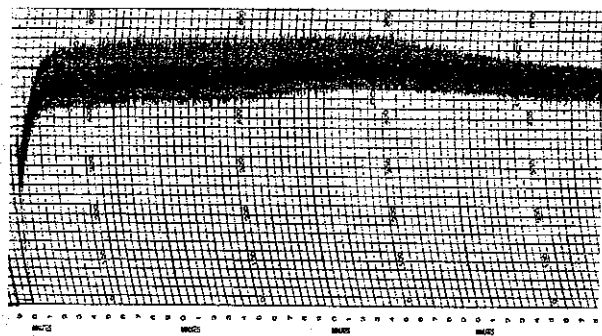
Sample Number	98-404	98-405	98-406	98-407	98-408	98-409	98-410	98-411
Variety Identification	Karl 92 (check)	Larned (check)	KS95 H167-3	KS95 HW62-6	KS96 HW94	KS96 ₂ HW118	KS84 063-2W	KS85 W663-42W
Wheat Data <i>Trego</i>								
FGIS Classification	HRW	HRW	HRW 1.1% HDWH	HDWH	HDWH 0.4% HRW	HDWH 0.9% HRW	HDWH	HDWH 0.6% HRW
Test Weight (lb/bu)	59.8	60.5	59.6	59.7	60.1	60.4	59.3	60.4
Hectoliter Weight (kg/hl)	78.7	79.6	78.4	78.6	79.1	79.5	78.0	79.5
1000 Kernel Weight (gm)	26.8	28.4	28.4	26.3	24.2	29.5	25.7	25.4
NIR Hardness	57	74	67	74	67	54	72	51
Wheat Size Test								
Over 7 Wire (%)	40.2	52.1	56.8	40.4	32.4	56.2	44.7	34.6
Over 9 Wire (%)	59.2	47.1	42.9	58.6	66.1	43.5	54.8	64.7
Through 9 Wire (%)	0.6	0.8	0.3	1.0	1.5	0.4	0.5	0.7
Single Kernel Analysis								
Hardness	64	76	69	81	81	69	78	60
Weight (mg)	28.1	30.3	29.9	28.2	26.0	30.3	26.2	26.1
Diameter (mm)	2.32	2.44	2.44	2.30	2.28	2.44	2.21	2.25
Moisture (%)	10.2	10.4	10.2	10.4	10.3	10.5	10.4	10.4
Protein (%)**	13.6	13.6	12.9	13.5	13.9	13.1	15.1	14.4
Ash (%)*	1.40	1.48	1.43	1.47	1.49	1.38	1.45	1.33
Milling and Straight Grade Flour Data								
	98-404	98-405	98-406	98-407	98-408	98-409	98-410	98-411
Straight Grade Flour Yield (%T.P.)	74.7	74.1	74.0	74.2	74.6	75.9	71.6	73.6
Moisture (%)	13.7	13.5	13.2	14.1	13.8	13.5	14.1	14.0
Protein (%)*	12.4	12.3	11.7	12.1	12.3	12.0	14.2	13.5
Ash (%)*	0.46	0.46	0.44	0.44	0.44	0.41	0.46	0.41
Glutomatic								
Wet (%)*	30.2	34.5	30.5	31.9	26.9	31.5	37.0	34.7
Dry (%)*	11.4	12.0	10.8	11.2	10.0	10.7	12.9	12.4
Index	98.5	95.4	97.4	96.4	99.3	98.7	97.7	97.7
Color								
Agtron Flour Color	85	82	84	83	83	89	82	89
Simon Flour Color	-0.13	0.45	0.32	-0.19	0.09	-0.54	-0.71	-0.93
Falling Number* (sec)	561	633	437	559	567	532	530	478
Avg. Micron Size								
Fisher Sub Sieve Sizer	19.5	22.9	21.3	23.7	21.9	20.5	22.5	20.2

** 12% moisture basis; *14% moisture basis

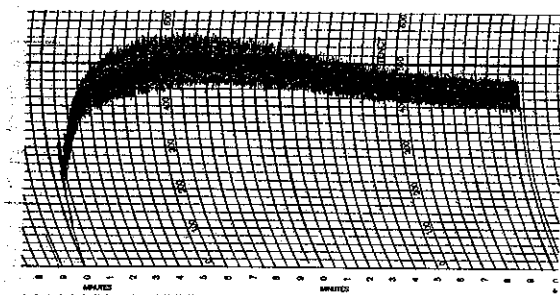
Physical Dough Tests

1998 (Small Scale) Kansas

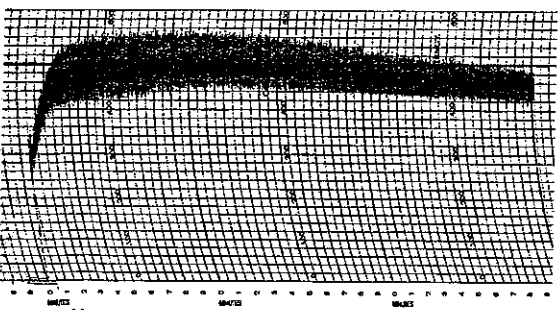
Farinograms



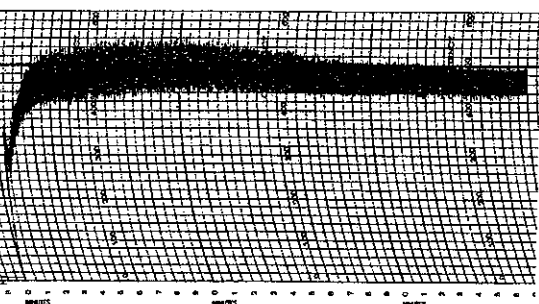
Abs: 58.7%, Peak: 25.5, Stab: 40.0



Abs: 62.9%, Peak: 6.5, Stab: 11.0



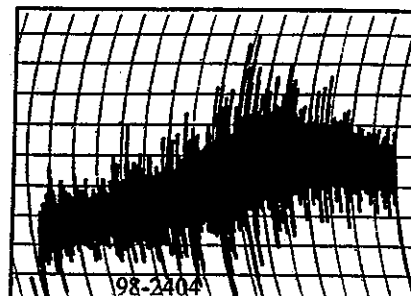
Abs: 57.6%, Peak: 12.5, Stab: 24.0



Abs: 61.1%, Peak: 10.0, Stab: 21.0

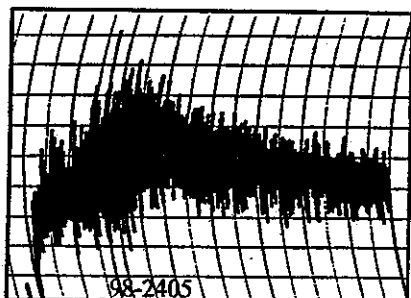
Mixograms

98-404
Karl 92 (check)



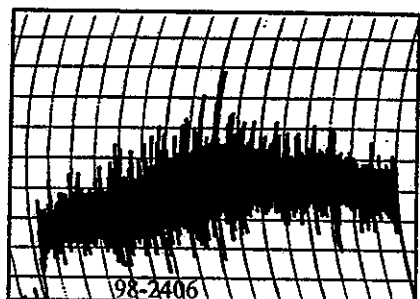
Abs: 63.6%, Peak: 5.4, Stab: 5

98-405
Larned (check)



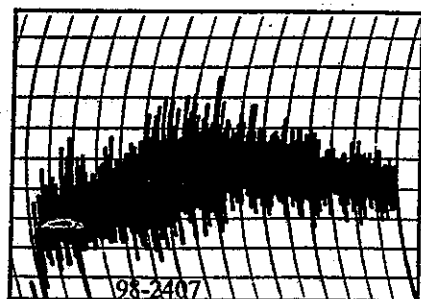
Abs: 64.0%, Peak: 2.6, Stab: 4

98-406
KS95HW167-3



Abs: 63.0%, Peak: 4.5, Stab: 4

98-407
KS95HW62-6



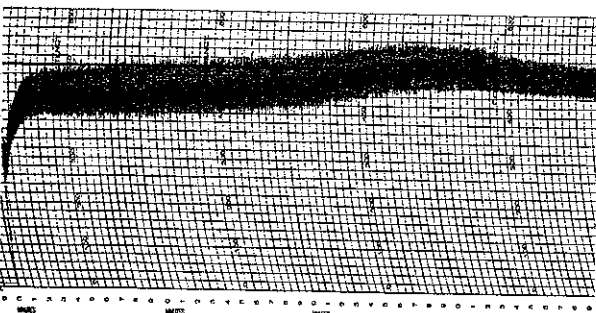
Abs: 64.0%, Peak: 3.9, Stab: 4

Physical Dough Tests

1998 (Small Scale) Kansas

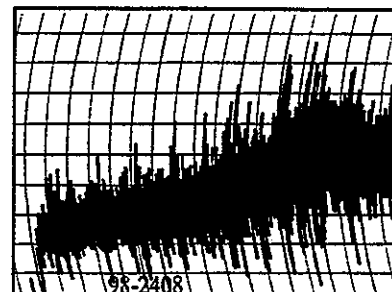
Farinograms

Mixograms

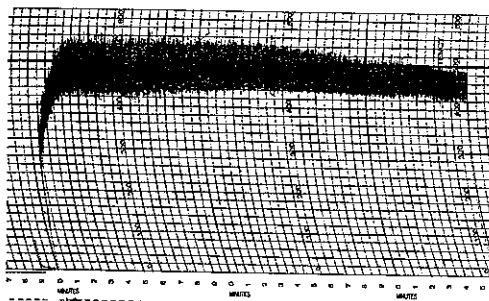


98-408
KS96HW94

Abs: 61.8%, Peak: 32.0, Stab: 35.5

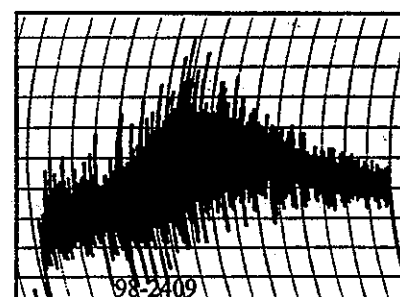


Abs: 65.0%, Peak: 7.4, Stab: 5

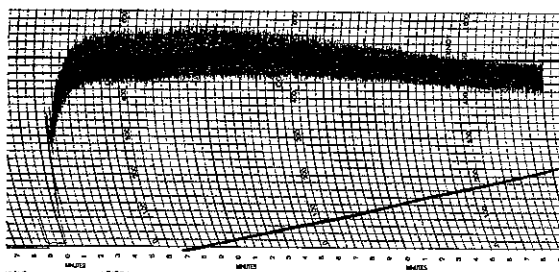


98-409
KS96HW115

Abs: 57.4%, Peak: 10.0, Stab: 21.5

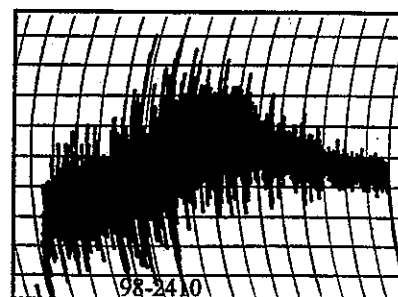


Abs: 64.0%, Peak: 3.9, Stab: 3

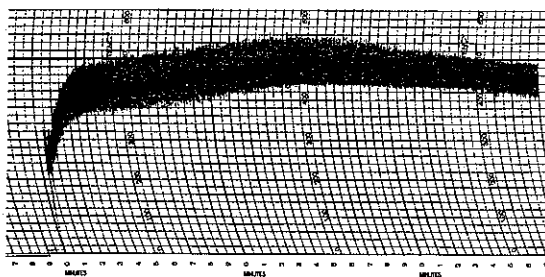


98-410
KS84063-2W

Abs: 62.1%, Peak: 10.5, Stab: 24.0

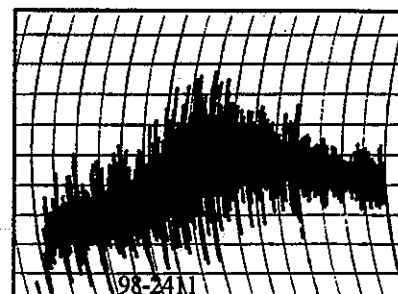


Abs: 66.7%, Peak: 4.0, Stab: 3



98-411
KS85W663-42W

Abs: 59.0%, Peak: 16.5, Stab: 20.5



Abs: 65.4%, Peak: 4.4, Stab: 3

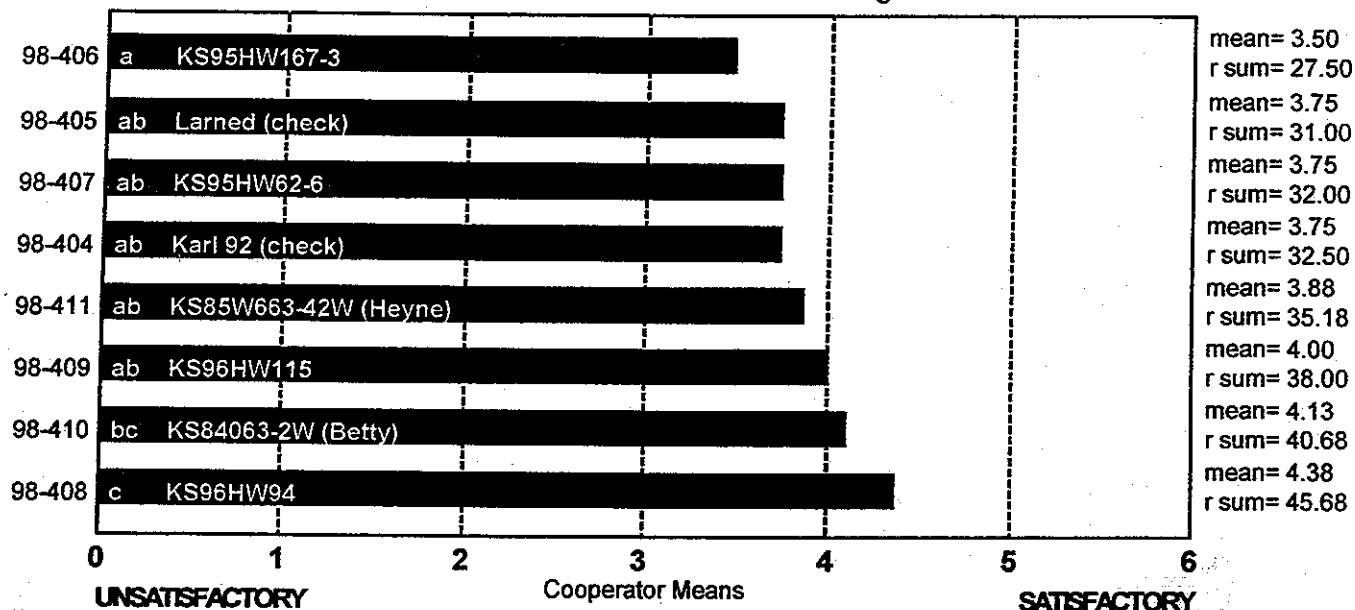
SPONGE CHARACTERISTICS

(Small Scale) Kansas

Variety order by rank sum.

Samples with the same letter not different at 5.0% level of significance.

ncoop= 8
chisq= -3.06
chisqc= 24.92
cvchisq= 14.07
crdiff= 12.99



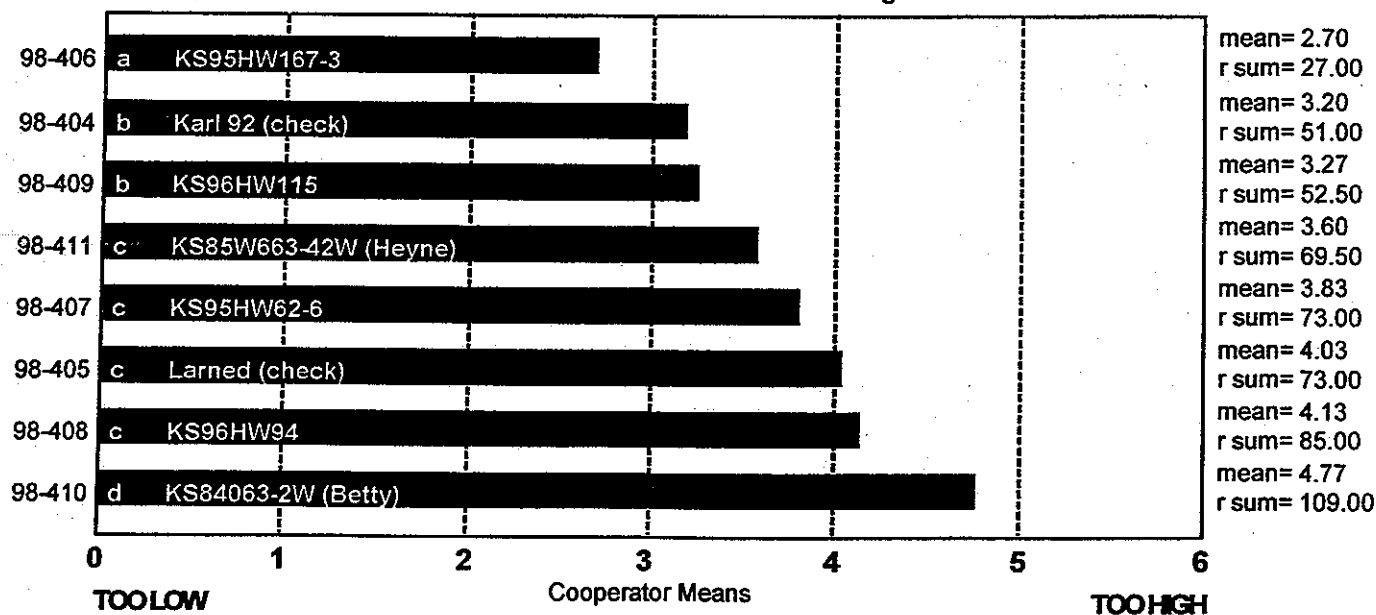
BAKE ABSORPTION

(Small Scale) Kansas

Variety order by rank sum.

Samples with the same letter not different at 5.0% level of significance.

ncoop= 15
chisq= 47.01
chisqc= 66.10
cvchisq= 14.07
crdiff= 16.69



BAKE ABSORPTION, ACTUAL (14% MB) (Small Scale) Kansas

	Coop. A	Coop. B	Coop. C	Coop. D	Coop. E	Coop. F	Coop. G	Coop. H	Coop. I	Coop. J	Coop. K	Coop. L	Coop. M	Coop. N	Coop. O	Coop. P
98-404 Karl 92 (check)	59.0	62.0	58.6	59.0	66.4	62.9	59.0	59.0	68.3	66.9	58.2	63.6	64.0	59.6	62.5	60.6
98-405 Larned (check)	63.5	62.0	59.0	62.0	65.2	62.7	61.0	59.0	68.4	66.7	63.8	64.0	63.5	63.5	63.0	61.1
98-406 KS95HW167-3	59.5	61.0	58.0	59.0	63.8	60.3	60.0	59.0	67.2	65.3	59.9	63.0	62.0	57.7	62.0	59.9
98-407 KS95HW62-6	62.5	62.0	59.0	60.0	66.9	63.5	62.0	59.0	68.9	65.8	58.6	64.0	64.5	62.5	63.0	61.6
98-408 KS96HW94	60.0	62.0	60.0	60.0	69.0	66.0	61.0	59.0	69.5	67.2	60.9	65.0	65.0	63.0	64.0	62.4
98-409 KS96HW115	60.5	62.0	59.0	59.0	65.1	63.6	61.0	59.0	68.3	65.6	58.1	64.0	63.5	58.4	63.0	61.1
98-410 KS84063-2W (Betty)	63.0	64.0	61.7	60.0	68.8	66.4	64.0	61.0	71.4	69.8	59.6	66.7	67.0	64.7	65.0	63.1
98-411 KS85W663-42W (Heyne)	61.0	64.0	60.4	59.0	65.7	64.1	60.0	60.0	70.2	66.2	57.0	65.4	63.5	59.5	64.5	61.5

Raw Data

BAKE MIX TIME, ACTUAL

(Small Scale) Kansas

	Coop. A	Coop. B	Coop. C	Coop. D	Coop. E	Coop. F	Coop. G	Coop. H	Coop. I	Coop. J	Coop. K	Coop. L	Coop. M	Coop. N	Coop. O	Coop. P
98-404 Karl 92 (check)	60.0	9.0	6.0	22.0	9.5	6.3	7.2	20.0	9.0	6.9	13.0	5.8	30.0	4.8	21.0	4.8
98-405 Larned (check)	33.0	6.0	5.0	19.0	3.8	2.8	4.0	7.0	5.0	3.1	5.0	3.0	5.0	2.5	11.0	2.5
98-406 KS95HW167-3	35.0	9.0	6.0	19.0	6.0	4.2	5.6	9.0	4.0	5.0	8.0	4.3	9.0	3.8	9.0	3.5
98-407 KS95HW62-6	32.0	6.0	7.0	20.0	5.5	3.8	5.2	11.0	4.0	4.2	8.0	4.5	6.0	3.5	10.0	3.5
98-408 KS96HW94	60.0	9.0	7.0	20.0	13.0	8.0	10.2	20.0	11.0	8.7	20.0	7.8	25.0	6.5	25.0	6.8
98-409 KS96HW115	4.0	6.0	6.5	20.0	5.1	4.2	5.0	16.0	6.0	4.2	7.0	4.0	7.0	3.3	10.0	3.0
98-410 KS84063-2W (Betty)	60.0	6.0	7.5	20.0	5.5	4.2	5.2	13.0	6.0	4.2	11.0	4.5	12.0	3.8	13.0	3.3
98-411 KS85W663-42W (Heyne)	60.0	9.0	5.5	20.0	6.0	4.8	5.0	12.0	7.0	4.7	8.0	4.5	16.0	3.3	9.0	3.0

Raw Data

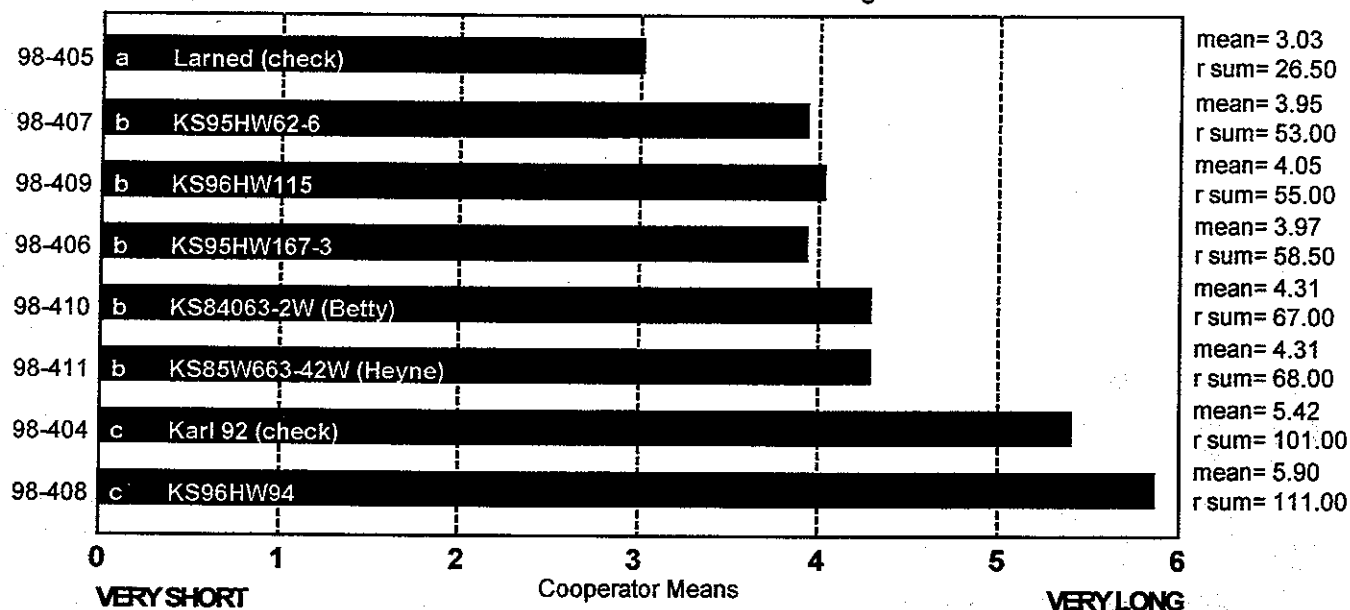
200100117

BAKE MIX TIME (Small Scale) Kansas

Variety order by rank sum.

Samples with the same letter not different at 5.0% level of significance.

ncoop= 15
chisq= 57.15
chisqc= 65.58
cvchisq= 14.07
crdiff= 15.94

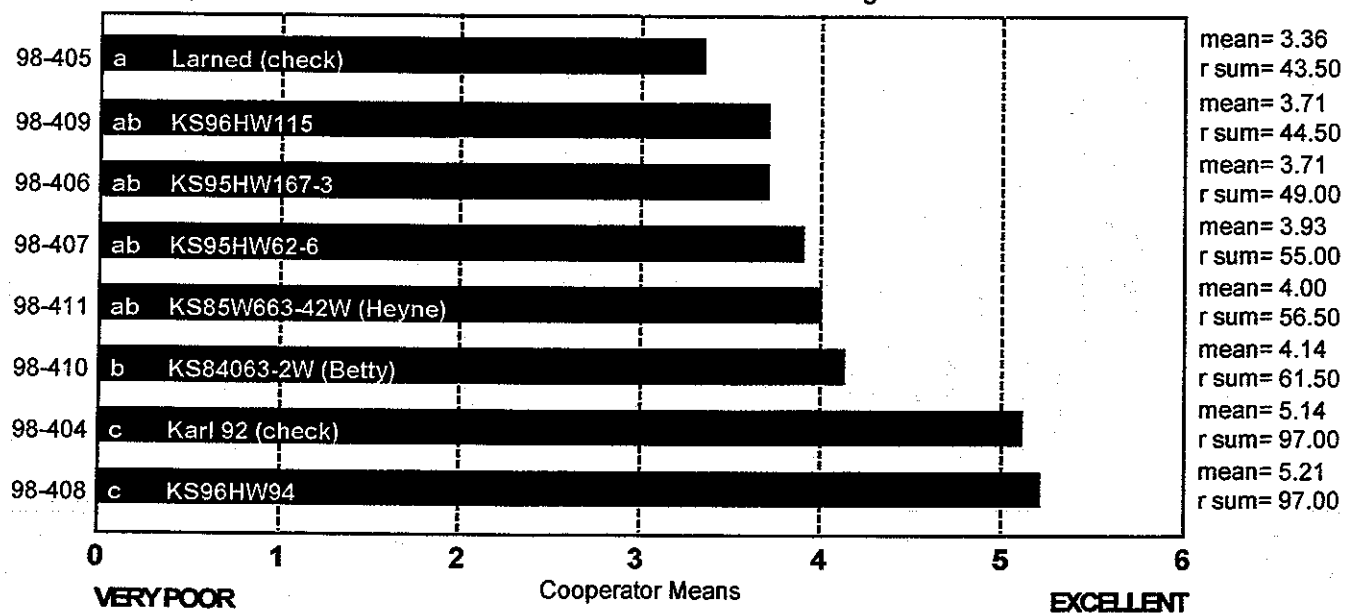


MIXING TOLERANCE (Small Scale) Kansas

Variety order by rank sum.

Samples with the same letter not different at 5.0% level of significance.

ncoop= 14
chisq= 39.75
chisqc= 48.14
cvchisq= 14.07
crdiff= 17.50



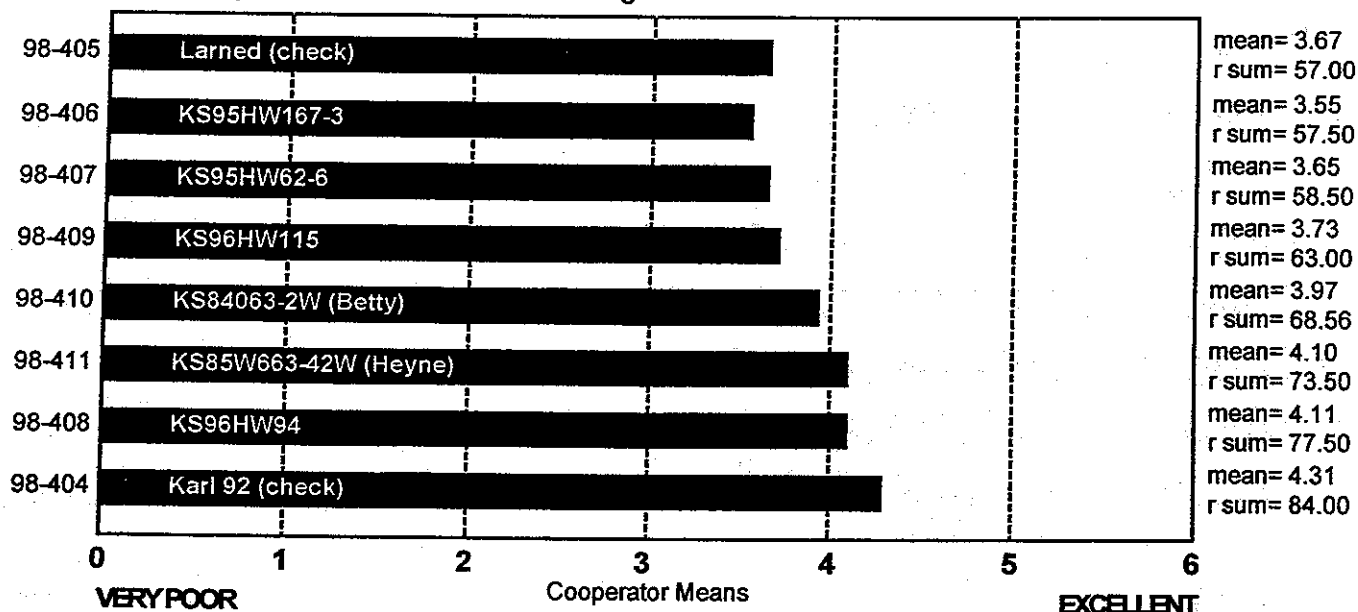
DOUGH CHAR. 'OUT OF MIXER'

(Small Scale) Kansas

Variety order by rank sum.

No samples different at 5.0% level of significance.

ncoop= 15
chisq= 7.34
chisqc= 13.60
cvchisq= 14.07
crdiff=



DOUGH CHAR. 'OUT OF MIXER', DESCRIBED

(Small Scale) Kansas

	Sticky	Wet	Tough	Good	Excellent
98-404 Karl 92 (check)	0	0	6	8	1
98-405 Larned (check)	0	1	3	10	1
98-406 KS95HW167-3	0	1	3	10	1
98-407 KS95HW62-6	3	0	3	9	0
98-408 KS96HW94	1	0	8	5	1
98-409 KS96HW115	1	0	3	9	2
98-410 KS84063-2W (Betty)	1	0	5	7	2
98-411 KS85W663-42W (Heyne)	0	0	4	7	4

Frequency Table

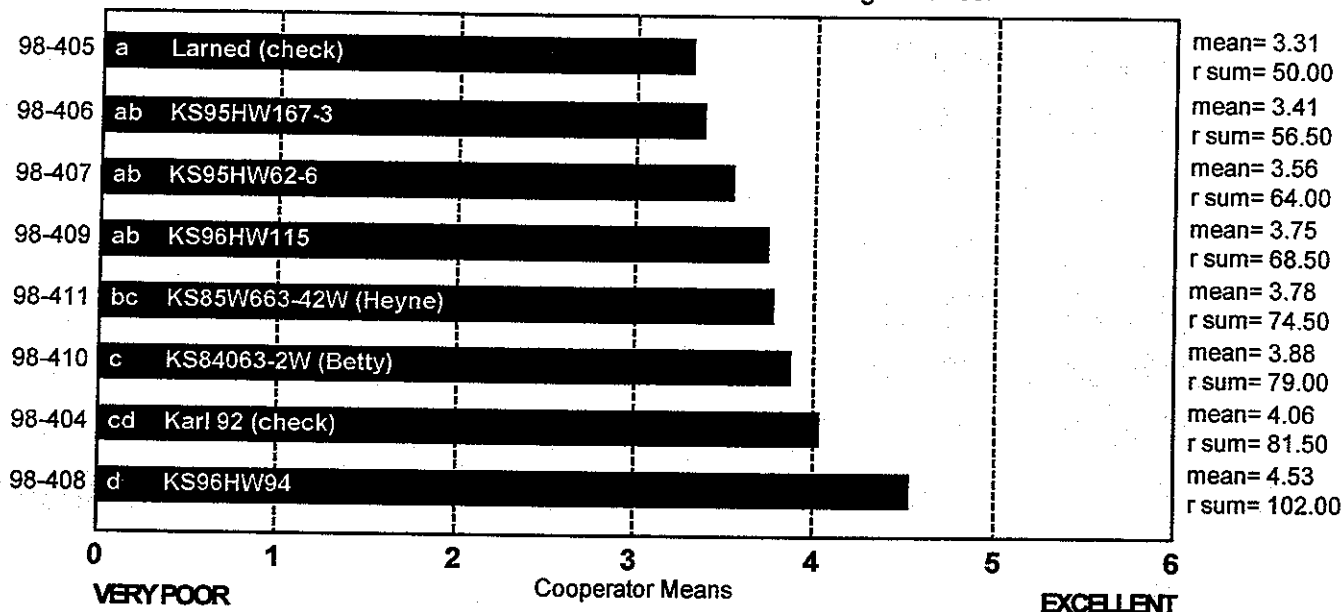
DOUGH CHAR. 'AT MAKE UP'

(Small Scale) Kansas

Variety order by rank sum.

Samples with the same letter not different at 5.0% level of significance.

ncoop= 16
chisq= 19.23
chisqc= 25.51
cvchisq= 14.07
crdiff= 21.91



DOUGH CHAR. 'AT MAKE UP', DESCRIBED

(Small Scale) Kansas

	Sticky	Wet	Tough	Good	Excellent
98-404	0	0	7	5	3
Karl 92 (check)	0	0	1	13	0
98-405	0	1	4	8	2
Larned (check)	0	0	2	12	1
98-406	0	0	12	3	0
KS95HW167-3	0	0	3	10	2
98-407	0	0	6	6	3
KS95HW62-6	0	0	5	7	3
98-408	0	0	0	0	0
KS96HW94	0	0	0	0	0
98-409	0	0	0	0	0
KS96HW115	0	0	0	0	0
98-410	0	0	0	0	0
KS84063-2W (Betty)	0	0	0	0	0
98-411	0	0	0	0	0
KS85W663-42W (Heyne)	0	0	0	0	0

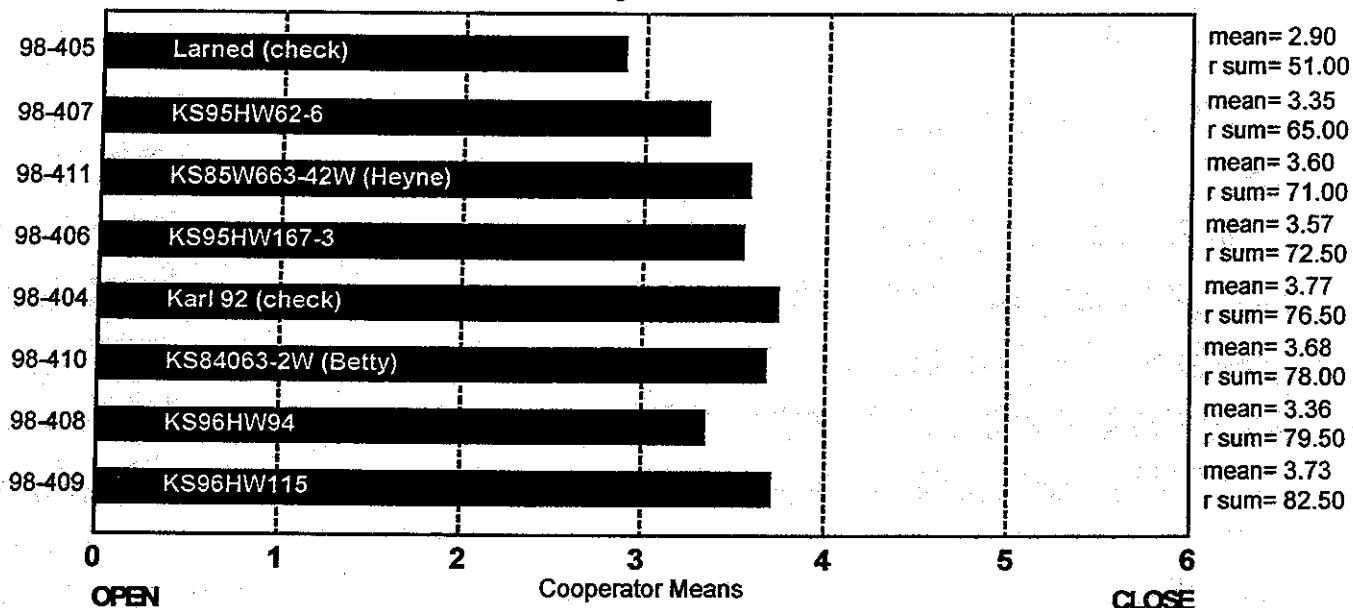
Frequency Table

CRUMB GRAIN (Small Scale) Kansas

Variety order by rank sum.

No samples different at 5.0% level of significance.

ncoop= 16
chisq= 7.44
chisqc= 9.01
cvchisq= 14.07
crdiff=



CRUMB GRAIN, DESCRIBED (Small Scale) Kansas

	Open	Dense	Irregular
98-404 Karl 92 (check)	5	4	3
98-405 Larned (check)	8	3	2
98-406 KS95HW167-3	5	3	4
98-407 KS95HW62-6	7	3	4
98-408 KS96HW94	5	5	2
98-409 KS96HW115	4	4	3
98-410 KS84063-2W (Betty)	8	4	2
98-411 KS85W663-42W (Heyne)	8	5	1

Frequency Table

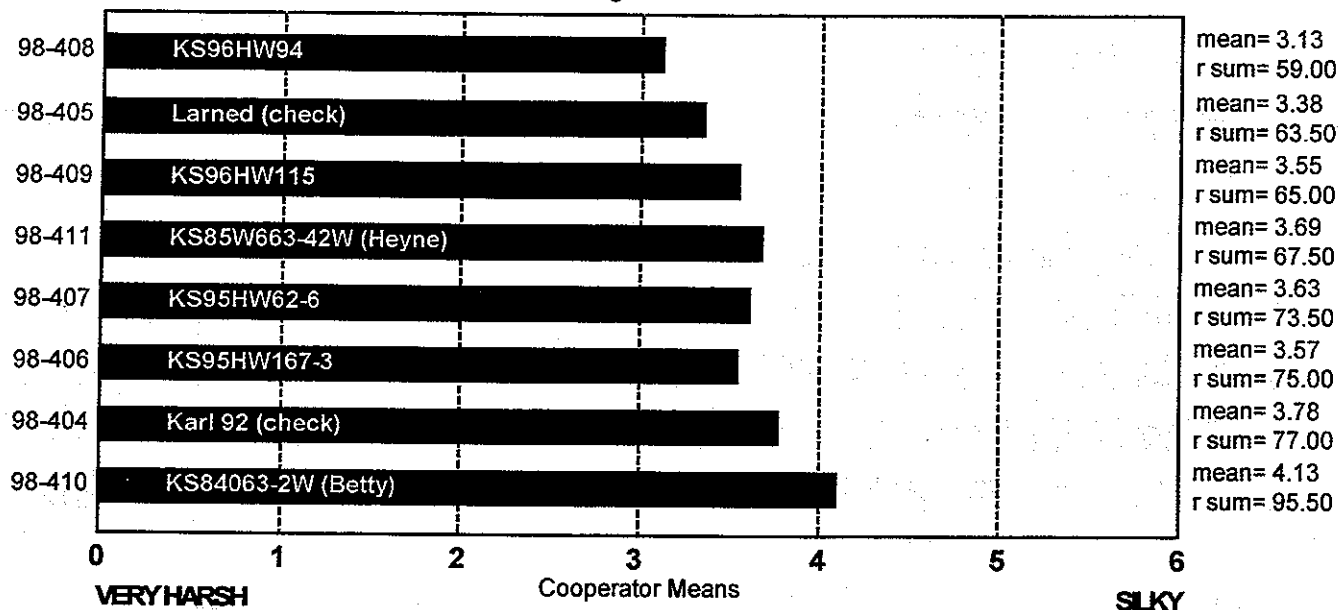
CRUMB TEXTURE

(Small Scale) Kansas

Variety order by rank sum.

No samples different at 5.0% level of significance.

ncoop= 16
chisq= 9.36
chisqc= 13.30
cvchisq= 14.07
crdiff=



CRUMB TEXTURE, DESCRIBED

(Small Scale) Kansas

	Coarse	Harsh	Silky
98-404	3	2	8
Karl 92 (check)	2	5	7
98-405	4	3	6
Larned (check)	1	4	9
98-406	4	5	5
KS95HW167-3	3	3	7
98-407	2	3	9
KS95HW62-6	3	2	8
98-408	3	2	8
KS96HW94	3	2	8
98-409	3	2	8
KS96HW115	3	2	8
98-410	3	2	8
KS84063-2W (Betty)	3	2	8
98-411	3	2	8
KS85W663-42W (Heyne)	3	2	8

Frequency Table

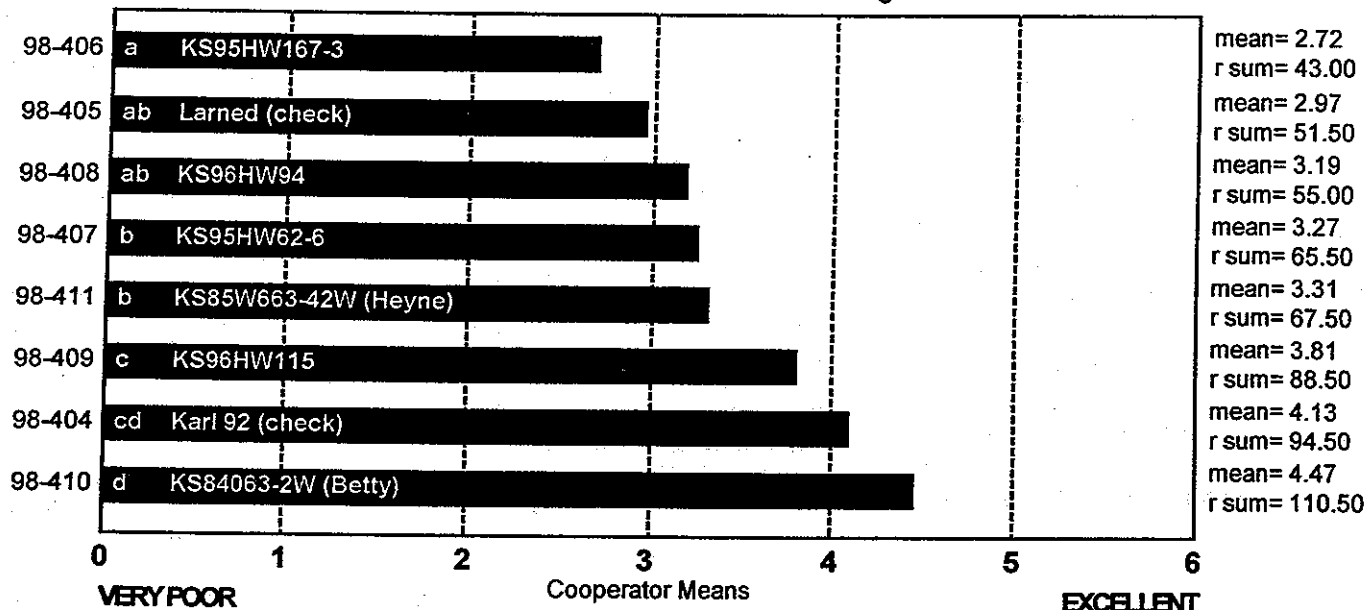
CRUMB COLOR

(Small Scale) Kansas

Variety order by rank sum.

Samples with the same letter not different at 5.0% level of significance.

ncoop= 16
chisq= 40.35
chisqc= 51.26
cvchisq= 14.07
ordiff= 18.77



CRUMB COLOR, DESCRIBED

(Small Scale) Kansas

	Yellow	Gray	Dull	Creamy	Bright White
98-404 Karl 92 (check)	2	0	1	5	6
98-405 Larned (check)	5	0	1	7	0
98-406 KS95HW167-3	5	0	4	5	0
98-407 KS95HW62-6	3	0	3	7	1
98-408 KS96HW94	4	0	2	6	2
98-409 KS96HW115	2	0	0	9	2
98-410 KS84063-2W (Betty)	1	0	0	6	6
98-411 KS85W663-42W (Heyne)	4	0	1	7	1

Frequency Table

CELL SHAPE, DESCRIBED

(Small Scale) Kansas

	Round	Irregular	Elongated
98-404	0	9	5
Karl 92 (check)			
98-405	2	8	4
Larned (check)			
98-406	1	10	2
KS95HW167-3			
98-407	3	9	1
KS95HW62-6			
98-408	2	10	2
KS96HW94			
98-409	3	6	5
KS96HW115			
98-410	1	7	6
KS84063-2W (Betty)			
98-411	1	8	4
KS85W663-42W (Heyne)			

Frequency Table

CELL THICKNESS, DESCRIBED

(Small Scale) Kansas

	Too Thin	Too Thick	Variable	Broken	Acceptable
98-404	1	0	6	0	6
Karl 92 (check)					
98-405	0	3	4	0	6
Larned (check)					
98-406	0	2	8	0	4
KS95HW167-3					
98-407	0	3	6	0	4
KS95HW62-6					
98-408	1	3	4	0	5
KS96HW94					
98-409	0	2	6	0	5
KS96HW115					
98-410	0	2	7	0	4
KS84063-2W (Betty)					
98-411	0	2	5	0	6
KS85W663-42W (Heyne)					

Frequency Table

LOAF WEIGHT, ACTUAL

(Small Scale) Kansas

	Coop. A	Coop. B	Coop. C	Coop. D	Coop. E	Coop. F	Coop. G	Coop. H	Coop. I	Coop. J	Coop. K	Coop. L	Coop. M	Coop. N	Coop. O	Coop. P
98-404 Karl 92 (check)	466.0		490.0		153.4	139.0	132.4	421.0	454.0	150.5	597.0	139.7	460.2	130.0	421.2	131.6
98-405 Larned (check)	456.0		495.0		152.5	139.8	136.3	423.0	448.0	154.0	594.0	141.2	461.1	135.0	418.5	133.7
98-406 KS95HW167-3	462.0		490.0		149.1	136.7	136.1	420.0	449.0	150.0	594.0	139.7	459.6	129.0	417.0	133.9
98-407 KS95HW62-6	457.0		490.0		153.0	138.6	136.0	419.3	448.0	150.8	597.0	142.7	461.4	133.0	416.8	137.2
98-408 KS96HW94	464.0		495.0		151.8	139.2	136.3	422.5	453.0	151.2	605.0	144.6	460.8	133.0	422.7	134.8
98-409 KS96HW115	462.0		495.0		152.0	140.4	136.1	420.5	448.0	153.4	598.0	145.6	464.3	132.0	419.1	137.4
98-410 KS84063-2W (Betty)	457.0		495.0		152.9	139.2	142.1	422.0	451.0	154.6	596.0	144.7	459.8	135.0	417.8	138.5
98-411 KS85W663-42W (Heyne)	460.0		495.0		151.0	138.2	136.6	420.0	446.0	149.4	594.0	146.2	463.0	132.0	418.9	136.2

Raw Data

LOAF VOLUME, ACTUAL

(Small Scale) Kansas

	Coop. A	Coop. B	Coop. C	Coop. D	Coop. E	Coop. F	Coop. G	Coop. H	Coop. I	Coop. J	Coop. K	Coop. L	Coop. M	Coop. N	Coop. O	Coop. P
98-404 Karl 92 (check)	2600	1125	2850	3045	970	955	970	2800	2625	955	2625	1025	3000	995	2226	900
98-405 Larned (check)	2600	990	3125	2809	900	900	940	2800	2550	1020	2350	925	2800	915	2133	800
98-406 KS95HW167-3	2625	1095	3125	2839	975	965	930	2800	2500	1010	2450	920	2875	950	2256	855
98-407 KS95HW62-6	2600	1045	3050	2853	970	915	915	2800	2325	925	2375	875	2725	925	2250	795
98-408 KS96HW94	2550	900	2475	2750	950	915	955	2700	2275	915	2600	950	2500	965	2103	840
98-409 KS96HW115	2650	1045	2975	2750	925	960	935	2700	2425	995	2300	945	2725	925	2256	825
98-410 KS84063-2W (Betty)	2675	980	3300	2927	1005	1105	990	2800	2375	1045	2425	1100	2913	1060	2183	865
98-411 KS85W663-42W (Heyne)	2775	1055	2900	2868	975	1000	1020	2750	2550	1025	2450	975	2825	1025	2153	890

Raw Data

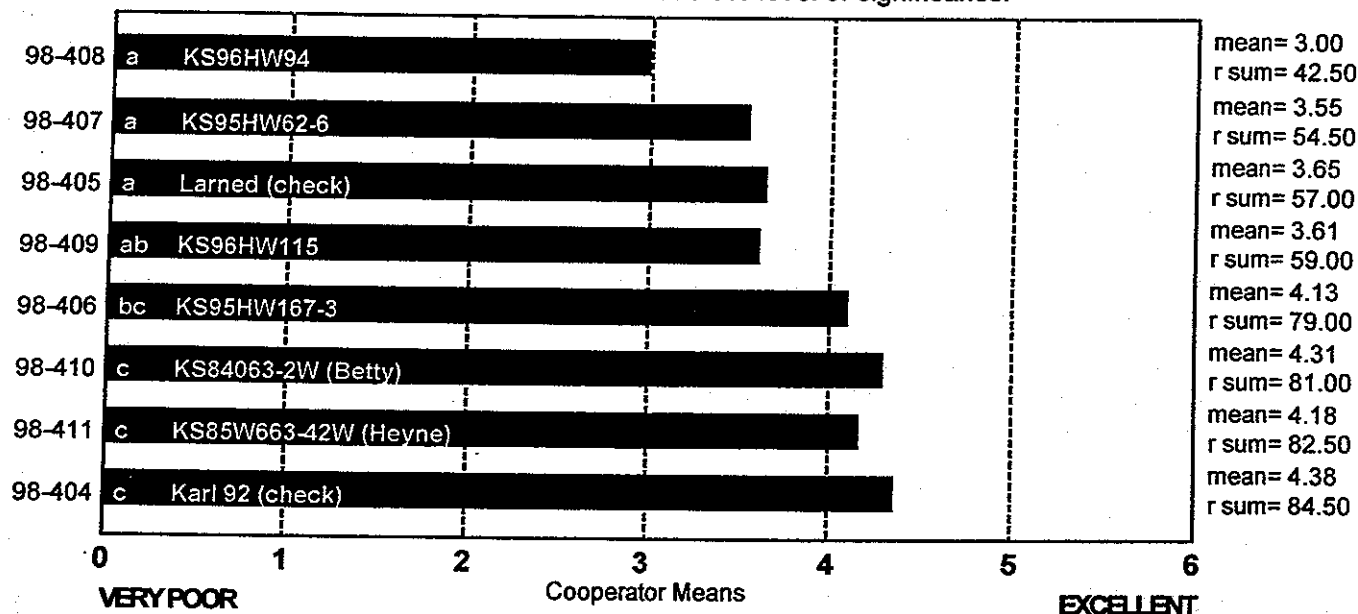
LOAF VOLUME

(Small Scale) Kansas

ncoop= 15
 chisq= 20.06
 chisqc= 25.45
 cvchisq= 14.07
 crdiff= 21.54

Variety order by rank sum.

Samples with the same letter not different at 5.0% level of significance.



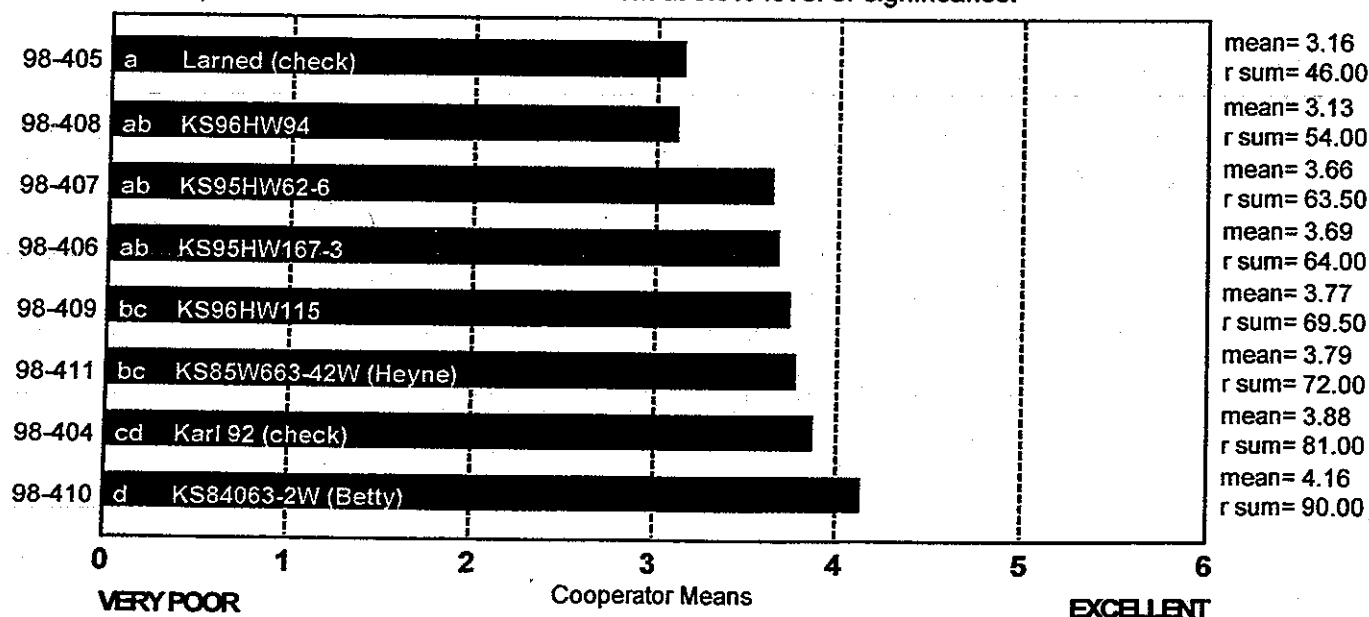
OVERALL BAKING QUALITY

(Small Scale) Kansas

ncoop= 15
 chisq= 15.39
 chisqc= 18.16
 cvchisq= 14.07
 crdiff= 23.34

Variety order by rank sum.

Samples with the same letter not different at 5.0% level of significance.



COOPERATOR'S COMMENTS

(Small Scale) Kansas

98-404 Karl 92 (check)

- Very strong dough
- crumb grain=sl. dense; cell shape = sl. elongated; color=white
- strong mixing flour, irregular streaky grain; good volumes, creamy crumb color
- Long mix time
- 13 ppm AA
- Slightly weak crumb texture
- MOISTURE 13.43 ASH(14%) 0.489 PROTEIN(14%) 12.21
- Bake mix time may be too long
- Best of show in quality, but low absorption; cell thickness=thin=desirable
- Slight Shell Top, Break Little Rough, Slightly Dry
- v. long mixt; hi abs.; v. nice grain; elastic dough; v. hi volume; crumb texture=good; crumb grain=closed
- Would be a good flour to blend with weaker flours.

98-405 Larned

- Dead dough
- crumb grain=sl. dense; cell shape = sl. elongated
- strong flour, open, irregular grain, low volumes, creamy crumb color
- Good absorption and crumb grain
- 75 ppm AA; oxidation; mix time; volume
- Slightly weak crumb texture
- MOISTURE 13.29 ASH(14%) 0.461 PROTEIN(14%) 12.07
- sl. short mixt; avg. abs.; poor grain; yellow; weak dough; good volume; at makeup=weak

98-406 KS95H167-3

- dead dough, lower absorption, good internals
- crumb grain=sl. dense; cell shape = sl. elongated
- good mixing strength, open grain, slightly low to average volumes.
- Good absorption, loaf vol. and crumb grain
- 38 ppm AA
- Strong and extensible dough out of the mixer
- MOISTURE 13.02 ASH(14%) 0.483 PROTEIN(14%) 11.64
- Very good loaf volume for its flour protein content. Very good crumb grain.
- out of mixer=sl. tough; cell thickness=thin=desirable
- Nice Break, Little Dry
- avg. mixt; avg. abs.; sl. open grain; yellow; elastic dough; good volume.

COOPERATOR'S COMMENTS (con't.)

(Small Scale) Kansas

98-407 KS95HW62-6

- crumb grain=sl. dense; cell shape = sl. elongated; color=white
- strong mixing flour, open grain, average volume
- Good absorption, loaf vol. and crumb grain
- 38 ppm AA
- Slightly weak crumb texture
- MOISTURE 13.85 ASH(14%) 0.458 PROTEIN(14%) 11.97
- out of mixer = very tough
- Break Slightly Rough, Little Dry
- avg. mixt; hi abs.; avg. grain; silky texture; nice dough; avg. volume.

98-408 KS96HW94

- slight core, very strong dough, good internals
- tough, bucky
- out of mixer=tough/old
- very strong mixing flour, open irregular grain, low volume
- Long mix time- messy dough while mixing- otherwise good
- 0 ppm AA; mix time
- MOISTURE 13.42 ASH(14%) 0.430 PROTEIN(14%) 12.13
- Crumb grain somewhat questionable, mix time too long.
- Too long of mix times; cell thickness=thin=desirable
- Good Break, Dry; Long time for mix pickup added .5 min
- v. long mixt; hi abs.; nice grain; tough sponge; elastic dough; low volume.
- Sides of loaf were a little concave.

98-409 KS96HW115

- slightly dead dough
- crumb grain=sl. dense; cell shape = sl. elongated; color=sl. creamy
- mix strength was very good, open, irregular grain, low volumes
- Good absorption, loaf vol. and crumb grain
- 38 ppm AA
- Slightly weak crumb texture
- MOISTURE 13.15 ASH(14%) 0.419 PROTEIN(14%) 11.87
- Very good loaf volume and crumb grain.
- out of mixer=sl. tough; Very low absorption
- Nice Break, Little Dry
- avg. mixt; avg. abs.; nice grain; nice dough; avg. volume; crumb grain=closed

COOPERATOR'S COMMENTS (con't.)

(Small Scale) Kansas

98-410 KS84063-2W

- excellent but very strong dough
- color=white
- Extremely strong flour, open, irregular grain, above average volume
- Excellent exterior and interior crumb, white, silky
- 38 ppm AA; crumb grain
- MOISTURE 13.60 ASH(14%) 0.460 PROTEIN(14%) 14.00
- out of mixer= sl. tough; Poor texture and color
- Nice Break, Large Volume, No Shell Top at all
- sl. long mixt; hi abs.; avg. grain; silky texture; white; nice dough; hi volume.

98-411 KS85W663-42W

- excellent but very strong dough
- crumb grain=sl. dense;
- strong flour, open grain, average volumes
- Excellent exterior and interior crumb, white, silky
- 25 ppm AA
- Strong and extensible dough out of the mixer
- MOISTURE 13.76 ASH(14%) 0.436 PROTEIN(14%) 12.59
- at make-up= sl. tough; cell thickness=thin=desirable
- Nice Break
- long mixt; avg. abs.; good grain; elastic dough at makeup; good volume;
- crumb texture=good
- Short proof time.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE**EXHIBIT E**
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
Kansas Agricultural Experiment Station	KS95HW62-6	Trego
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country)	5. TELEPHONE (include area code)	6. FAX (include area code)
Waters Hall Kansas State University Manhattan, KS 66506	785-532-6147	785-532-6563
	7. PVPO NUMBER	
	200100117	
8. Does the applicant own all rights to the variety? Mark an "X" in appropriate block. If no, please explain. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		

9. Is the applicant (individual or company) a U.S. national or U.S. based company? If no, give name of country		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. Is the applicant the original owner? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO If no, please answer <u>one</u> of the following:		
a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)? <input type="checkbox"/> YES <input type="checkbox"/> NO If no, give name of country		
b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company? <input type="checkbox"/> YES <input type="checkbox"/> NO If no, give name of country		
11. Additional explanation on ownership (if needed, use reverse for extra space):		

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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